

# COMPUTERWORLD

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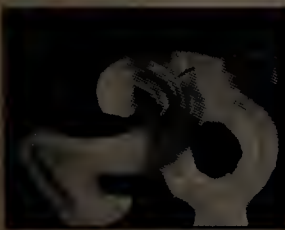
MAY 14, 1984

VOL. XVIII, NO. 20



## In Depth

The genesis of a language  
Follows 86



## In Depth

Cobol celebrates its silver anniversary ID/7

## In Depth

Don't rush to court when your system fails  
— try negotiation/ID/19

## FOLLOW-UP

# IBM's object code policy still irking users

*IBM's wish to "protect" customers from the need to modify software is arrogant. They're telling customers what they think is good for [the customer].*

— Gabriel Goldberg, VM user

*I absolutely despise it. It makes problem determination more difficult. And practically speaking, it's impossible for me to modify when there are enhancements I need that IBM cannot or will not deliver.*

— Pete Clark, Olin Mills, Inc., Chattanooga, Tenn.

By Paul Gillin  
CW Staff

It has been just over a year since IBM announced that it would begin restricting source code availability on selected systems software products. The comments above are indicative of some of the ill will



that still exists in the IBM user community over the controversial IBM practice, which has come to be known as object code only.

The practice of object code only is intended to combat what the computer giant perceives as a threat to its software

assets from other manufacturers, in particular the Japanese. The restrictions are also aimed at reducing problems associated with installing enhanced versions of systems software at user sites where heavy modifications have been made.

Today, an uneasy peace has been made between IBM and its users over the object-code-only policy. Users who do not modify their IBM systems software say the practice has had little impact on their installations. But interviews with users who do modify indicate that the topic is still an extremely sensitive one.

A substantial chunk of the user community is not comfortable with what some feel is a one-sided policy imposed too quickly by IBM and with too little regard for the problems it would create.

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## TOP OF THE NEWS

Telecommunications users will pay lower Message Toll Service and Wats rates as the result of an access charge ruling that the Federal Communications Commission made last week. Page 2.

Digital Equipment Corp. offered a peace pipe to its Decsystem-10 and 20 users by adding two machines to those mainframe lines, along with three data management software packages. Page 4.

Microcomputers are making maximum news. Digital Research, Inc. announced software that lets IBM Personal Computers run four programs concurrently under PC-DOS and/or CP/M; Hewlett-Packard Co. entered the portable computer fray with an 8½-lb, battery-powered microcomputer; and Burroughs Corp. became the ninth vendor to sell a microcomputer based on Convergent Technologies, Inc. hardware. Page 4. A.B. Dick also tossed its hat into the ring with a supermicro entry. Page 113.

Get ready, get set ... for the IBM local-area network? The company last week announced a cabling scheme that does away with coaxial cable. Page 9.

Texas Instruments, Inc. filled the gap in its semiconductor product line by signing an agreement that gives it the right to manufacture National Semiconductor Corp. microprocessors. Page 10.

Want good seats for a Philadelphia 76ers game? Change jobs. Some firms are resorting to novel approaches — and incentives — to attract DP professionals. Page 22.

# Appeal of T1 lines on the increase



## CW AT ICA

Conference coverage  
continues on pages 12-16

By John Dix  
CW Staff

LAS VEGAS — Large telecommunications users almost without exception are using, or at least considering, wide bandwidth digital communications facilities to carry multiple data and voice channels.

That was what attendees of the International Communications Association's annual meeting told *Computerworld* here last week. While those interviewed reported varying amounts of experience with T1 lines — the designation typically used for digital communications facilities that operate at the domestic telephony standard of 1.54M bit/sec — all

said they are at least looking into the use of T1 facilities.

With multiplexers designed for the application, users can divide the bandwidth of a T1 line into a number of slower speed channels. A single T1 line, for example, can support 24 digital data channels operating at 64K bit/sec or the same number of voice signals digitized at that rate. At lower speeds, a T1 line can support even greater numbers of channels.

Interest in T1 lines stems mostly from simple economics. Vincent J. Dalmonte, director of telecommunications for Prudential Insurance Co. in Roseland, N.J., said that with today's communications costs, a user needing more than three digital 56K bit/sec lines can cost-justify a single T1 facility.

But economy is not the only aspect of T1 use that users are studying. Ray H. Stone, See T1 page 12

# Medical experts say VDTs don't cause birth defects, miscarriages, eye damage

By Jake Kirchner  
CW Washington Bureau

WASHINGTON, D.C. — Medical experts last week said VDTs do not cause birth defects, miscarriages or vision damage and do not need to be regulated by the federal government.

Representatives of the American College of Obstetricians and Gynecologists and the American Academy of Ophthalmology told a U.S. House of Representatives subcommittee investigating VDT safety issues that scientific evidence proves there is no reproduction or vision danger from using VDTs. Specifically, the subcommittee was told that there is no reason for VDT operators to request transfers to other jobs during pregnancy or to demand periodic eye examinations.

"Based on the scientific evidence to date, the American College of Obstetricians and Gynecologists concludes that radiation emitted from [VDTs] is insufficient to cause spontaneous abortions, birth defects or any other adverse effect on reproductive function," said Dr. Marcus B. Bond, a representative from the college who has also served on the American Medical Association's Advisory Panel on Reproductive Hazards in the Workplace.

Bond reviewed for the Education and Labor Subcommittee on Health and Safety a number of investigations of alleged instances of VDT harm to pregnant workers. "All of the ... investigators concluded that radiation emissions from VDTs were insufficient to

See VDT page 2



## NEWS

# BOCs told to reduce access tariffs by \$1.142 billion

By Bryan Wilkins  
CW Washington Bureau

WASHINGTON, D.C. — The Federal Communications Commission last week told the divested Bell operating companies to cut their access tariffs by \$1.142 billion after the commission ruled that the divested operating companies had overstated the projected costs of implementing the access charge system.

As a result, the commission also ordered AT&T to cut the rates it charges users for its regular long-distance Message Toll Service and Wats to reflect the reduced charges that it will pay local telephone companies

for access to their facilities. The FCC said AT&T had understated its projected revenues by \$1.8 billion, which would exceed its 12.75% authorized rate of return.

The FCC ordered the divested operating companies to file new tariffs by May 18 and said they would go into effect May 25 if approved. Last week's action does not affect the \$6/mo per line access fee charge for business users that is scheduled to go into effect June 13, nor does it affect the \$2/mo Centrex line fee.

Separately, the FCC announced that it has opened an investigation into the validity of tariff-support in-

formation filed by AT&T and the divested operating companies. "I am troubled by these figures," said FCC Chairman Mark Fowler. "We cannot do business when the numbers are so far removed from reality."

The FCC action reducing the access charge tariff was not unexpected, observers said, since in recent weeks a consensus emerged that the divested operating companies had overstated their costs of instituting an access charge system, reflected in the tariffs they filed with the FCC. The FCC twice already has ordered the divested operating companies to make changes in the tariffs; last

week it finally told them exactly how much they must shave off the tariffs.

The International Communications Association, a large users group whose members annually spend more than \$1 million each on telecommunications, has argued the case with the FCC that the divested operating companies' access costs were overstated by \$3 billion to \$4 billion because the figures were based on projections and estimates before the divestiture had taken place.

The FCC last week took no action in the separate investigation matter of so-called special access tariffs regarding private lines.

## VDT from page 1

cause adverse health effects," Bond said.

Because the emissions from VDTs are within acceptable safety standards, they should not be regulated by the government, Bond said, adding that "the use of lead shields and encasing VDTs in metal shielding to protect pregnant women is unwarranted in view of the data."

The American Medical Association, the American Council on Science and Health and the March of Dimes have come to the same conclu-

sion, he said.

Investigations of the reported clusters of reproductive problems among VDT operators found "no specificity in the birth defects reported," unlike what would have been expected had the problems arisen from a common cause like VDT use, Bond said.

### Ergonomic factors

Bond did note that ergonomic factors can have a considerable influence over the comfort of VDT operators. But, he said, there is no medical or scientific reason for VDT opera-

tors to switch to other occupations during pregnancy.

Addressing allegations that VDT use can cause cataracts and other serious eye damage, testimony submitted by Dr. William L. Rich III for the American Academy of Ophthalmology said, "The academy has concluded, based upon existing scientific evidence, that [VDTs], or units, are safe for normal use and present no hazard to vision."

Rich said that while "there is little doubt that VDT use is a demanding visual task, just as reading of printed materials is a demanding visual task,

and that heavy VDT use can be stressful to the eyes, just as prolonged reading or typing can be stressful, [the academy] has found no evidence to date that any pathologic eye condition can be worsened or accelerated by VDT use or that a normal eye can be damaged by use of VDTs."

The academy also told the subcommittee that it "does not at this time believe that available scientific evidence warrants annual ophthalmologic or optometric eye examinations purely on the basis that a worker regularly uses a VDT."

## NEWS SUMMARY

Digital Equipment Corp. today announced additions to its Decsystem families as well as data management software/4

Digital Research, Inc. unveiled software that lets IBM Personal Computers run four programs at once/6

A beta test site user said that Cullinet Software, Inc.'s IDMS/R relational data base management system has opened up new opportunities for end-user computing in his installation/8

IBM announced a wiring scheme that does away with coaxial cables/9

Texas Instruments, Inc. obtained the microprocessors missing from its product lineup and National Semiconductor Corp. obtained a valuable second-source manufacturer with a cooperative agreement on 32-bit products/10

Data processing managers see the micro as a positive tool, but they want more guidance from above in developing acquisition and use policies, a recent Data Processing Management Association survey found/11

**CW at ICA:** Both AT&T and MCI Communications Corp. announced new business-related communications offerings . . . Among the debuts at the show: an integrated voice/data office workstation from GTE Communications Systems Corp., a voice/data PBX from Honeywell, Inc. . . . The question of whether users would benefit from deregulation of AT&T was argued . . . Telecommunications users said they are seeking alternatives to private lines because of the long lead times required to get dedicated facilities installed . . . A consultant ex-

pects private branch exchanges able to switch both packetized and non-packetized digital data streams this year/12-16

The federal tax credit for corporate research and development efforts has a 50:50 chance of being made permanent, according to a specialist in high-tech legal issues/19

One firm gives basketball tickets, another uses billboard ads, but most firms looking for data processing personnel frown on novel recruiting methods/22

Whether the System/38 will ever be able to take full advantage of its relational data base capabilities will depend partly on IBM's success in making the processor compatible with the IBM Personal Computer, attendees at a meeting of IBM users were recently told/24

Two Texas county government officials are in disagreement over whether the county's mainframe should have been ignored when a microcomputer system was leased/26

A mobile computer center built to withstand extremes of hot and cold has been serving Sante Fe International's oil drilling camps in Venezuela for two years with no reported problems/28

Singapore Airlines has not only one of the most modern fleets of aircraft in the world, but one of the most modern and well-stocked DP shops in Asia/30

Several Japanese businesses are conducting their banking transactions via personal computers/32

CATV's future as an alternative communications service appears bleak, indus-

try watchers said recently/33

An on-line data base of transportation and freight payment information is helping a pharmaceutical manufacturer control its distribution and traffic costs/36

A manufacturer of array processors says it has sharply increased production by using a computer-aided design and manufacturing system to design printed-circuit boards/38

The Pacific Telesis Group said it has improved its business DP operations and customer service with an interactive communications system that involves some 100,000 shared terminals and circuits for easier data base access/39

A Montgomery Ward and Co. data center discovered it could do without an additional mass storage system/40

Business success taxed a promotion firm's disk and computer room capacity until a double-density disk system and controller saved space and cut back on head contention/47

Oregon state legislators have quickened turnaround time on key legislative documents by more than 25%/48

Time, Inc.'s distribution division has installed micros and an electronic mail network/51

A firm that manages hotels and conference centers has found microcomputers to be cost-effective tools/50

A lobbyist group's microcomputer needs have grown from a single system to a sophisticated network/54

Collectors are handling a heavier work-

load while slashing customers' delinquency rates since U.S. Telephone, Inc. automated its accounts receivables/57

A U.S. Army command is deploying stand-alone microcomputers to prepare for the major changes that OA will cause/58

A New York sporting goods store is using an IBM System/34 for keeping track of everything from softballs to sweat socks/59

An inventory and tracking system is giving a manufacturer an efficient flow of tools to the right people at the right time/60

A productivity system has allowed a manufacturer of printed-circuit boards to keep pace with its rapid growth/64

A filter manufacturer is using a materials requirements planning system to meet the demands of a worldwide market/65

A Pennsylvania service bureau is keeping its out-of-production IBM printer linked to its Hewlett-Packard Co. computers/67

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## NEWS

# DEC adds two Decsystems, data management tools

By James Connolly  
CW Staff

MAYNARD, Mass. — Emphasizing that it still plans no new family of 36-bit processors, Digital Equipment Corp. today announced two additions to its Decsystem-10 and 20 mainframe series, along with three data management packages.

DEC Vice-President for Large Systems Marketing Rose Ann Giordano said the announcements are consistent with the policy announced last year when the firm scrapped its Jupiter project — a planned sequel to the Decsystem-10 and 20 lines — in favor of providing Decsystem users with "integration tools" that will allow their software to run on VAX-11 superminicomputers [CW, May 30, 1983].

The processors, the Decsystem-1095 and 2065, offer 20% better throughput and prices at least 22% lower than the existing Decsystem-1091 and 2060.

The processors can be purchased as complete systems or configured by adding upgrade boards to Decsystems already in the field, DEC officials said.

According to the company, the products illustrate DEC's commitment to its Decsystem-10 and 20 users and its commitment to integrating that installed base with its VAX-11 superminis and PDP-11 minicomputers and microcomputers.

Giordano also said that the Decsystem-1095 and 2065 boast 20% better performance than their predecessors because their 18K-byte cache/pager capacity is double the capacity of earlier caches, and their hardware page table has been doubled to

1,024 page table entries, while the number of directory entries has risen from 128 to 512.

The new systems are said to have a 95% cache hit ratio.

The Decsystem-1095 and 2065 use 64K MOS chips, which offer more primary storage capacity in the same floor space, DEC said. The company claimed the memory can be used to upgrade Decsystem-1091 and 2060 configurations through a trade-in program.

Giordano said the targets for the processors are existing DEC mainframe customers in research, industry, commerce and universities. She added that while the company is not seeking new users for the Decsystem line, new systems will be available.

Deliveries of both new systems and upgrade boards are scheduled for this summer.

The basic 1095 and 2065 systems feature the processor, cache/pager unit, 8M bytes of memory, a 176M-byte disk drive, a Decwriter III hard-copy console terminal, a 16-asynchronous-line front end and the Tops-10 operating system for the 1095 and Tops-20 for the 2065. Basic prices are \$395,000 for the 1095 and \$355,000 for the 2065.

The upgrade, consisting of a board substitution and backplane modifications, costs \$40,000.

The software packages announced today were the Datatrieve-20 application generator and new releases of DBMS-20 and Traffic-20. All three packages will be available during the summer, according to DEC.

Compatible with DEC's Datatrieve packages for the VAX-11, PDP-11 and Professional 350 comput-

ers, Datatrieve-20 is said to allow users to access, define, store, update and display data in Tops-20 record management services files with a record-oriented query language. It reportedly allows retrieval of data from remote Decsystem-20, VAX-11 and PDP-11 processors through the Decnet networking software and associated hardware. It costs \$10,000.

DBMS-20 Version 6.1 reportedly is Codasyl software that lets the user define, access and maintain data in either hierarchical or network forms. DEC officials said data base records can be referenced through Cobol-based or Fortran-based statements.

Version 6.1 features Ansi-1978 Fortran character data support and an extended data manipulation language utility with user-defined commands, video display and keypad functions, logging facilities and error translation. Designed for use as a teaching tool, for testing as a debugging aid and as a low-volume data base manipulator, it is priced at \$34,500.

Traffic-20 is a collection of general-purpose routines that reportedly enable users to develop on-line data entry, update and retrieval applications such as order entry, accounts payable/receivable and inventory control. Traffic-20 routines are said to act as extensions to Macro, Fortran and Cobol application languages and enable programs in those languages to display formatted screens and accept input data from terminals. Traffic-20 is priced at \$6,000.

DEC is located at 146 Main St., Maynard, Mass. 01754.

## ANALYSIS

## Today's announcement a peace offering for current Decsystem users?

By Tom Henkel  
CW Staff

Today's announcement of more performance and increased software support for its Decsystem mainframe lines appears to be a peace offering that Digital Equipment Corp. is holding out to its users.

A year ago, DEC made Decsystem users hopping mad by announcing at its Decus users group meeting that it had dropped plans to develop a successor to the 36-bit Decsystem line [CW, May 30, 1983]. More powerful high-end products would come from the 32-bit VAX line of superminicomputers, DEC said. DEC strongly implied that Decsystem users would have to migrate to the VAX.

A year later, DEC is standing by its commitment to making the VAX its showcase processor. But DEC's attitude, perceived by many users and industry watchers last year as one of "take it or leave it," appears to have mellowed.

Today, DEC offered two olive branches to Decsystem users: faster processors (the Decsystem-1095 and 2065), which offer users up to 20% greater internal throughput; and three software packages (Datatrieve-20, DBMS-20 Version 6.1 and Traffic-20), aimed at making it easier for Decsystem-20 users to share data with other DEC systems, such as the VAX-11 and PDP-11 (story above).

"It's probably the best they can do," said Randall Bennett, MIS director at Edgcomb Steel of New England, in reaction to the announcements. A Decsystem-10 user, Bennett said DEC is probably limited in the amount of performance it can eek out of the aging Decsystem line.

But Bennett noted that he has mixed feelings about the announce-

ments. While the \$40,000 upgrade kit, which allows current Decsystem users to move to the newer processor models, will probably allow him to extend the life of his system by another year, "I can't seem to plan ahead," he said. His Nashua, N.H., firm does not want to spend more money on aging technology (his Decsystem-10 processor uses core memory), but it also does not relish the idea of migrating to the VAX.

What Bennett really wants, he said, is what he cannot get — the extension to the Decsystem line that DEC canceled last year.

### One year to stew

Steven Smith, a securities analyst with Paine Webber Mitchell Hutchins in New York, said the DEC announcements are "barely enough to keep [Decsystem] users happy." Recalling that many irate users at last year's Decus meeting felt DEC had left them out in the cold, Smith said, "I'm surprised at the way DEC has handled this."

Why DEC let its Decsystem users stew for the past year remains a mystery. DEC's vice-president of large systems marketing, Rose Ann Giordano, told *Computerworld* that DEC held off on announcing enhancements to the Decsystem line last year because the products simply were not ready. But Smith maintained that doubling cache memory and adding a new paging unit to an existing processor (the lion's share of the 20% performance improvement) are not major hardware enhancements.

On the software side, Bob Randolph, a senior consultant at International Data Corp., a market research firm in Framingham, Mass., said that none of the software DEC announced

today is, at least in a conceptual sense, new. Two of the packages, Traffic-20 and DBMS-20, have been around at DEC since the late 1970s. And the Datatrieve package has been available for other DEC processors for some time, Smith added.

One theory is that DEC was playing a "wait-and-see" game to determine whether Decsystem users would take the plunge and migrate to the VAX line. Many users have not indicated a willingness to do so; thus DEC is being forced into providing additional enhancements or risk losing Decsystem users to IBM.

"Decus put the pressure on them," said Peter Lowber, an analyst with the Boston-based Yankee Group consulting firm. "DEC was going full throttle" to eliminate the Decsystem

from its product line and force its users to migrate to the VAX, but backed off after DEC representatives at last year's Decus meeting were battered by verbal abuse.

But DEC's Giordano argued the firm's intent for the Decsystem was misunderstood. DEC never meant to leave Decsystem users without options, according to Giordano, and instead has been working to develop software and hardware enhancements that would allow data and applications running in Decsystem processors to be more easily accessible by other DEC processors, such as the VAX-11 and PDP-11. Giordano said today's announcements are part of that ongoing commitment and promised that more products will be announced.

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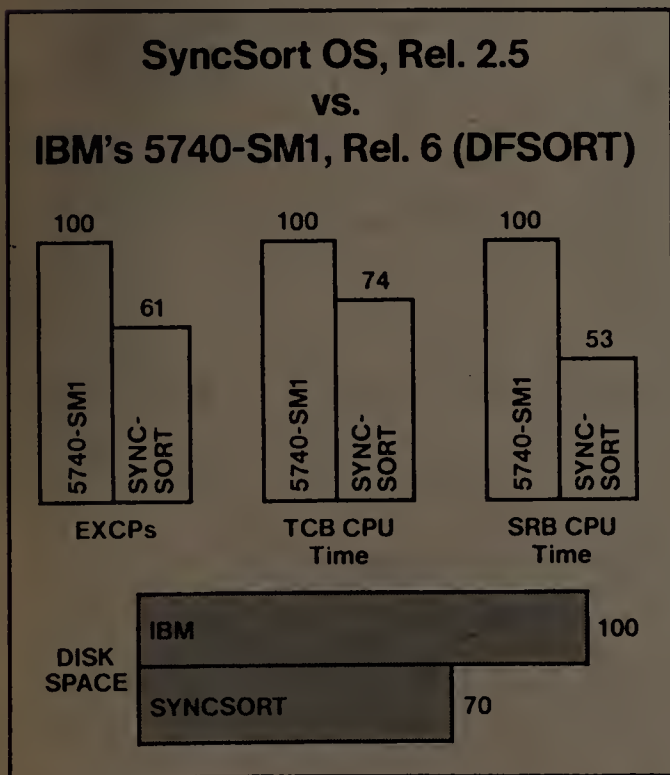
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If you're tired of betting on sort programs that empty your pockets of resources and are tough to handle, give us a call. We'll arrange to have SyncSort OS 2.5 run a few furlongs on your own turf.



## NEWS

# IBM micro gets ability to run four programs

By Paul Korzeniowski  
CW Staff

PACIFIC GROVE, Calif. — Accepting rather than fighting the emergence of IBM's PC-DOS operating system as a de facto microcomputer operating system standard, Digital Research, Inc. last week announced Concurrent PC-DOS, which allows users of the IBM Personal Computer to run four programs simultaneously using PC-DOS and/or Digital Research's CP/M operating systems.

For example, one program can print a report while a second dials a data base service; a third waits for electronic mail and the fourth runs a spreadsheet.

Digital Research is targeting Concurrent PC-DOS at large corporate users. "The majority of these users have the IBM PC-DOS operating system and are looking for the capabilities that this operating system provides," said Darrell Miller, Digital Research's marketing manager for operating systems.

In addition to offering concurrent capabilities, Digital Research plans to bundle a communications program and card file software with the product, which reportedly will be available in the third quarter. "We have looked at a number of communications programs, but have not decided if we will use another vendor's product or develop our own package," Miller said.

## Concurrent PC-DOS features

Concurrent PC-DOS, which costs \$295, supports up to four windows; includes menu-driven generation of operating system commands, such as COPY and DIRECTORY; allows the user to customize menus and store window formats in batch mode; and features print spooling capability, according to Digital Research.

The program requires 256K bytes of random-access memory (RAM) and a floppy disk, but Digital Research recommends an IBM Personal Computer with 512K bytes and a hard disk. "Most of the popular PC-DOS programs require 128K of RAM," Miller said. "The floppy disk drive is difficult to use because the user has to insert and remove the various program disks."

Concurrent PC-DOS allows users to send files between PC-DOS and CP/M applications, the vendor claimed. "The software allows the user to copy a file so that it is compatible with either operating system," Miller stated.

Concurrent PC-DOS will run almost all programs designed for the IBM Personal Computer, according to Miller. But "there are a few programs that do not conform to operating system or hardware constraints," he said.

Concurrent PC-DOS can support two users, with one attaching a dumb terminal to the micro's serial port.

Digital Research is located at 160 Central Ave., Pacific Grove, Calif. 93950.

# HP enters portable fray with 8½-lb unit

By Jeffry Beeler  
CW West Coast Bureau

CUPERTINO, Calif. — Hewlett-Packard Co. last week entered the portable computer fray with the introduction of a battery-powered personal computer that reportedly performs standard financial and business tasks and weighs 8½ pounds.

Included in the HP Portable's library of built-in application packages and embedded on a read-only memory (ROM) chip is Lotus Development Corp.'s 1-2-3, according to Nicholas Fowler, product manager with the firm's Portable Computer Division.

The Portable also supports four other built-in programs:

- HP's proprietary Personal Applications Manager, which buffers users from the machine's Microsoft, Inc. MS-DOS 2.11 operating system.

- A package that emulates the HP 2621 terminal and allows the Portable to exchange files with the company's Model 150 Touchscreen micro or HP 3000 series business computers.

- A Help facility that replaces hard-copy documentation.

- HP's Memo Maker word processing package.

## Lacks integrated disk unit

All the HP Portable's standard application programs reside in 384K bytes of ROM, Fowler said. The Portable lacks an integrated disk unit, although the processor does permit the attachment of an external 3½-in. diskette module.

Why did HP decide to forego a built-in magnetic storage unit? First, Fowler said, ROM weighs less than a memory that incorporates electromechanical parts and thus promotes portability. Second, a diskette module is more susceptible to damage from bumps and jolts — the inevitable hazards of a traveling computer — than other forms of mass storage.

The Portable's combination of light weight, integrated application programs and relative immunity from shock suits the machine for use in corporate learning centers and lending libraries, Fowler added. Many large companies, in fact, are



The HP Portable is battery-powered.

expected to maintain central pools of the HP Portables and lend them as necessary to their globe-trotting executives.

## Flat-panel display

In addition to a 16-bit Intel Corp. 8086 microprocessor operating at 5.3 MHz, the Portable incorporates a flat-panel display that holds up to 16 lines, each with as many as 80 char. The display also reportedly supports bit-map graphics with a resolution of 128 pixels by 480 pixels.

All of the micro's circuitry, including its 272K bytes of random-access memory, is implemented in Cmos form to minimize power consumption, Fowler said.

Electricity for the product is supplied by three D-cell batteries that are permanently integrated into the micro's cabinet and can be recharged throughout their five-year service life.

In typical use, the batteries last an average of one to two weeks between rechargings, Fowler said. A "fuel gauge" included in the Portable's flat-panel display continuously monitors the batteries' power level, he added.

Measuring 13 in. wide by 10 in. deep by 3 in. high, the machine can

gain access to other HP processors — as well as to IBM computers and central mainframes — through its integrated 300 bit/sec modem.

The Portable also comes with an HP Interface Loop connection and an RS-232C serial port that together accommodate an add-on 710K-byte diskette module and the company's recently announced Think Jet personal printer.

With its add-on printer and 3½-in. diskette attachment included, the latest addition to HP's microcomputer family is said to weigh 20 pounds. All three hardware modules fit in an optional system carrying case.

## External diskette unit

The external diskette unit reportedly provides access to a wide variety of additional software products, including five programming languages and industry-standard application packages for communications, spreadsheets, graphics, word processing and data base management.

Prices for the Portable start at \$2,995, with volume shipments set to begin in June.

More information about the product can be obtained from HP's Portable Computer Division at 1000 N.E. Circle Blvd., Corvallis, Ore. 97330.

# Burroughs unveils 16-bit micro, terminates B20

By David Myers  
CW New York Bureau

NEW YORK — Burroughs Corp. last week became the ninth company to announce plans to sell a 16-bit microcomputer based on Convergent Technologies, Inc. hardware. The company also announced that it will end production of its B20 systems later this year.

Burroughs unveiled the long-awaited B25 microcomputer with a price tag of \$4,000. That includes 256K bytes of random-access memory, a 12-in. single-color display monitor, a detachable keyboard and dual floppy disk drive modules.

This master workstation can support up to five additional cluster workstations, according to Burroughs, with cluster versions selling for under \$2,700.

The B25 micro, able to run concur-

rent programs under Digital Research, Inc.'s CP/M 86, Microsoft, Inc.'s MS-DOS and Burroughs' Btos operating systems, is driven by an Intel Corp. IAPX 80186 microprocessor chip. More than 250 third-party applications are being announced for the new system, Burroughs said.

## Optional 10M-byte drive

A 10M-byte hard disk drive is optional. Users can also add a series of snap-in modules to expand internal memory to 1M byte and external storage to 40M bytes.

Burroughs last week also brought out a \$26,000 cluster controller, the XE520 shared resource processor, to serve up to 32 directly connected B25 or B20 workstations.

Scheduled for shipment in the third quarter, the XE520 — also manufactured by Convergent Tech-

nologies for Burroughs — can provide up to 262.5M bytes of hard disk storage, along with extensive communications capabilities, according to the vendor.

The micro will be sold both by Burroughs' direct sales force and by dealers. Burroughs will be freeing manufacturing capacity as it phases out production of the B20 workstation over the course of the year, according to Edwin F. Carlson, president of Burroughs' Information Systems Group. Carlson added that Burroughs has no plans to match Convergent Technologies' announced Intel 8086-based version of the modular system.

More information on the Burroughs micro is available from the company's headquarters, which is located at Burroughs Place, Detroit, Mich. 48232.



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## NEWS

# Beta test user of IDMS/R lauds end-user benefits

## But has yet to build large-scale application with the relational DBMS



## FIRST USER

By Paul Gillin  
CW Staff

DALLAS — A beta test site user of Cullinet Software, Inc.'s IDMS/R relational data base management system (DBMS) and related products reported that the "friendlier software" has opened up new opportunities for end-user computing in his installation.

However, the software has not yet been used to build a large-scale application, noted Michael Intille, vice-president of information services at Central and South West Services, Inc. here. As a result, Intille could not say whether the added software will have a major effect on CPU performance.

But that issue is not a major one at Central and South West Services, a subsidiary of the \$2.6 billion Central and South West Services Corp., a major Southern utility. Unlike many users, Intille admitted, "I'm really not that concerned about [optimizing] performance. We've decided the prices are right if users are getting what they want."

That attitude is borne out by Central and South West Services' capacity plans. Its hardware growth rate was 81% last year, and Intille freely admitted that the company "will probably put in another computer early next year."

## Installed in February

Cullinet's IDMS/R, Information Database and Integrated PC Software for the IBM Personal Computer were installed in February. The company sees them as useful vehicles to offload some application development to end users.

The Cullinet products were Central and South West Services' first experience as a beta test site user. After two months, Intille said he is satisfied that IDMS/R provides all the relational capabilities the company sought and has not noticeably affected response times.

The combination of IDMS/R and ADS/On-Line has improved prototyping efficiency. "I had one programmer develop 30 screens in three days, working with the customer," he said.

The software has also allowed prototypes to be converted to applications more quickly, according to Intille. Using fixed elements at first, the data administrators are able to define schemata as the prototype is being developed. As screens are changed, so are the schemata. "Then, when the schema is defined, we start loading in data from the data base by just changing a single character," he said.

## Major task starting next week

Initial experiences with IDMS/R have been largely on small applications, Intille said, but the company will soon start to rewrite its aging customer system using IDMS/R. The application, which consists of about 1.5 million customer accounts at up to 1,000 data elements per customer, should be completed in about two years.

"Industry standards indicate that project should take three years and \$4 million," Intille said. "I'm hoping to keep it to \$2.5 million."

Intille said he is satisfied that IDMS/R contains all the relational attributes his company sought, including the ability to perform joins quickly. But he warned that switching from a network-based model to a relational model can present production problems.

"In some cases, it's too easy to attach data to itself and create ill-defined relations," he said. "You can join an apple to an orange and get a meaningless relation."

As a result, the shop is putting more emphasis on proper use of the data dictionary and on structured programming. Since the new Cullinet products were installed, "the data dictionary has become the heart of the system," Intille said.

That is particularly true where IBM Personal Computers are concerned. Central and South West Services plans to distribute more of its processing to micros using Cullinet's Integrated PC Software.

The micro package will enable the company "to control [Personal Computers] a little more closely," Intille said. It will also enable work to be done at the local level and then pulled together on the mainframe.

The Integrated PC Software, which was not available until about two months ago, was bug-ridden at the start and has not been used extensively, Intille said. The word processing portion of the

package "isn't as spiffy as we would like," he noted. However, he said Cullinet has worked out most of the problems.

"It's not the top in every category, but it's got all the basics," Intille said. "And when you put it together with the mainframe software, there's no comparison." He added that the company has sought to standardize on the Cullinet micro software "so people [won't] just throw out their old software every time something better comes along."

The primary advantage to the Integrated PC Software, according to Intille, is that it does not require the user to know where the data is stored. "The users define the elements they want on the spreadsheets on the local disks, and then the software goes and extracts from the mainframe," he said. "The only way you know if the data is resident on your [Personal Computer] is if the light on the disk drive goes on."

Central and South West Services has implemented a limited application of the Information Database. Subsets of an application data base are periodically pulled out and made available on a separate disk pack accessed by Personal Computers. Users can extract data directly from disk and load it into their spreadsheets.

Intille sees an immediate opportunity to use the micro software and Information Database to distribute budgeting functions to the local levels. "We can have individuals working on separate budgets on their [Personal Computers] and just perform a join at the mainframe level," he said, adding, "You just have to define data elements on the [Personal Computers] to the data dictionary as you go along."

With a \$26 million budget, the department supports an unusually high number of users. Of the 9,000 employees at the five operating companies served by Central and South West Services, more than 2,000 have terminals at their desks. Each operating company runs an IBM 4300 series processor locally and is tied in to the corporate data center running two 24M-byte Amdahl Corp. 470V/8 mainframes, a 12M-byte IBM 3032 mainframe and a Prime Computer, Inc. 750 superminicomputer. The company has installed more than 250 IBM Personal Computers in the past year, and Intille expects that number to double by the end of 1984.

## End-user participation high

DALLAS — End-user participation in application development projects at Central and South West Services, Inc. is unusually high. In fact, development projects are managed primarily by users.

The information services department recently added an information center containing "most of the standard information center software." It also restructured, putting the data administration function under the de facto control of the information center, according to Michael Intille, vice-president of information services.

Intille plans to continue that trend with a new range of products from Cullinet Software, Inc. (see story above). "The user is more powerful in this organization than I am," he said.

"To some degree, I'll be restricted in the size of the empire I can build if we can't farm out some of the applications to them."

Central and South West Services installed Cullinet's IDMS two years ago and added Cullinet's ADS/On-Line shortly thereafter. The deci-

sion to develop most new applications in the higher-level language was made after the information services department discovered that it could develop a major new application at less than one-third the cost using prototyping and productivity tools.

Another project, originally estimated as costing as much as \$3 million, was later developed in ADS/On-Line for about \$600,000, Intille added.

Prototyping has had a major impact on cost reductions. Because users are able to work with programmers interactively to build screens, "we're getting much better acceptance," Intille said. "Users are defining their requirements better by working with prototypes."

Moreover, such participation has happened without prompting from the information services department.

In one recent application, for example, users began to build prototypes using Lotus Development Corp.'s 1-2-3 before the coding had even begun.

## Two indicted for VAX shipment

CHICAGO — A federal grand jury here has indicted two foreign traders for allegedly shipping a Digital Equipment Corp. VAX-11/780 superminicomputer to Hong Kong without an export license. That processor may have traveled on to a communist country from Hong Kong, a free port with minimal trade restrictions, according to federal officials.

Charged with exporting the supermini without a U.S. license and falsifying shipping documents were Dennis J. Fife of New Zealand and London, a self-employed international computer dealer doing business as Dimension Systems Ltd. of London; and Anthony Chan, managing director of Wysh Data Systems Ltd. of Hong Kong, the company that was

falsely listed as the ultimate recipient of the computer. Chan and Fife have not yet been arrested.

The two allegedly bought the computer in 1982 from Computer & Terminal Exchange, a now defunct Pensacola, Fla., subsidiary of the Wyly Corp. of Dallas. Wyly and DEC were not charged in the case.

U.S. Customs Service officials reported that their agents seized part of the Hong Kong-bound shipment in Chicago in 1982, but have been unable to locate the processor itself. That processor allegedly was shipped from Atlanta to Chicago to Anchorage, Alaska, and then to Hong Kong. Federal officials said the link was discovered in the course of a Mobil, Ala., high-tech smuggling case.

## CORRECTIONS

Due to erroneous information supplied by the vendor, the April 30 *Computerworld* gave the wrong price for the First Computer Corp. Phase Encoded/Group Coded Recording Tape Subsystem.

The correct prices are \$12,500 for

a rack-mounting unit and \$13,040 for a cabinet model.

The photo accompanying the story "Firm replaces aging systems" [CW, May 7] was inadvertently switched with another picture and did not belong with the story.



## NEWS

# IBM announces wiring scheme eliminating coaxial cable

By John Dix  
CW Staff

RYE BROOK, N.Y. — IBM announced here last week a cabling scheme that does away with the need for coaxial cable and provides wall outlets for device connection.

The IBM Cabling System calls for buildings to be permanently wired with two types of balanced twisted-pair wires configured in a star topology. Once installed, the wire would be ubiquitously available and would eliminate the need to run cables every time new terminal equipment or small systems are installed.

According to an IBM statement of intention, the cabling system will eventually serve as the medium for a token-ring local-area network that the company will provide within two to three years.

The basic premise behind the Cabling System is to provide an outlet in each office into which devices can be plugged. Those outlets are connected via a standardized type of balanced twisted-pair wire to a distribution panel in a wire closet. Those panels are interconnected or wired back to a central computer room.

While the wiring topology of the Cable System is different from the dedicated coaxial cable system used today, in effect, the same physical connections are retained.

In practice, if a user wanted, for example, to connect terminal A to system B and both devices were connected to the same distribution panel, he would find the termination points on the panel that corresponded to the equipment in question, then physically interconnect them with a patch cord. To connect a

device to a remote piece of equipment, a patch would be made to the wire that runs to the panel supporting the other device.

IBM reported that 10 of its buildings have been wired with 3.5 million feet of cable and that installation is under way in 11 additional buildings. More than 2,800 devices in the 10 buildings are using the wire to transmit data, the company said.

Some industry observers view last week's announcement of the Cabling System as an IBM strategy to get large users to commit to eventual use of that vendor's local-area network.

"This announcement is pretty much what has been expected," said

Dixon Doll, telecommunications consultant with Ann Arbor, Mich.-based DMW Group. "The most important thing is that it puts in place the fundamental underpinnings for the transport local-area network that IBM can be expected to use in implementing many of the next round of products that will include software for higher layer networking, gateways and so on."

The cable and accessories that make up the Cable System will be available in July from these IBM authorized distributors: Ameritech Communications, Inc., Chicago; General Electric Supply Co., Bridgeport, Conn.; Graybar Electric Co., Inc., St.

Louis; South Central Bell, Advanced Systems Division, Birmingham, Ala.; Southern Bell, Advanced Systems Division, Atlanta; and Southwestern Bell Telecommunications, Inc., St. Louis.

Prices for the transmission cables used in the system range at an average of 50 cents per foot. The outlet style faceplates and connectors cost less than \$5 each. Distribution panels that connect 64 wires cost \$273 each. The device that provides the conversion from coaxial cable to twisted-pair wire costs anywhere from \$45 to \$155, depending on the type of device to be connected.

IBM is located in Rye Brook, N.Y.

## System Accounting in VM

*Who Has Their Hands in Your Information Center?*

Just six months ago, you told your executive committee that the proposed computer system for your Information Center would meet the corporation's needs for two years. Now it seems the system will be saturated in the next two months. Your chief executive wants to know why.

Your staff is able to identify individual users, but cannot track each user's resource consumption. You cannot identify where the overrun is.

System accounting in a VM interactive environment inherently demands a different approach than you may expect. VM just doesn't provide the raw accounting data offered by other systems. Still, you need to account for system and resource usage in your VM Information Center.

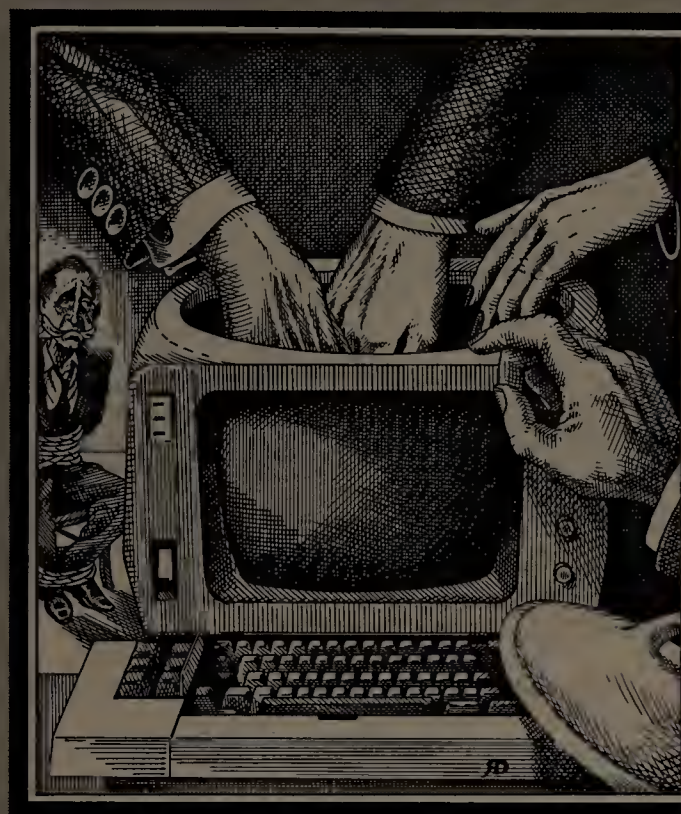
### PERSPECTIVE

Many MIS and DP executives began their careers in the MVS environment, and consequently view system software product evaluations from an MVS perspective. A VM based Information Center though, simply does not fit into the MVS world. That is not to say that VM is inherently better; it's just very different.

### HISTORY

MVS has been a strategic product for IBM since at least the early 1970s. This strategic "label" caused IBM to devote substantial development resources, over a long period, to enhancing MVS and all of its component parts. The success of this long term effort shows today: MVS is a robust, full featured, reliable, and stable batch operating environment. But as an interactive support environment, it is seriously deficient in terms of productivity and end-user friendliness.

This deficiency created the need for VM. The explosive growth in the number of VM sites is largely due to VM's clear superiority over MVS as an interactive decision support environment. As the Information Center and Development Center concepts grew in popularity, IBM labeled VM as a "highly strategic" product and began to devote extensive development resources to enhancing the product. IBM's VM



development team is moving aggressively to close the enhancement gap between MVS and VM.

### SYSTEM ACCOUNTING

A good example of the difference in relative sophistication of features between MVS and VM internals is in system accounting.

MVS allows you to collect over 200 different types of records from the Systems Management Facility (SMF) and the Resource Management Facility (RMF). Independent software vendors have created products that allow this SMF and RMF data to be summarized and reported in a myriad of useful ways. The key to this success is that MVS itself offers native realtime collection and management of these records in the SYS1.MAN data sets.

VM in contrast produces only six basic accounting records. Many more are required before system accounting in VM will reach the level of sophistication enjoyed by MVS. No software vendor can build a VM accounting product as complete and strong as the existing MVS products because the raw data just isn't available in VM. Many enhancements to MVS accounting came as a result of pressure from

IBM user groups. These groups are placing similar pressure now on IBM to enhance VM accounting. VM will evolve substantially, but you need resource accounting now.

### YOUR ACCOUNTING NEEDS

What is important to the MIS or DP manager in an interactive decision support environment? The accounting demands of MVS and VM system accounting are externally similar, but with significant internal differences. The needs are the same, but the implementations are different.

Let's look at your needs from an overall management perspective. First, if you are running an Information Center under VM, you don't have the control over resource consumption that you would under MVS, nor do you have the predictability of the timing of resource demand. Other departments can consume huge portions of your resources without notice, and worse, without accountability.

Next, you may be forced to fund large software purchases for another department with no way to recoup the cost or even determine whether the acquired software product is being used.

Similar problems exist in project accounting. You must be able to track expenditures to budget and enforce budget controls by project.

To be accurate in a VM environment, this data must be collected realtime. Batch accounting is sufficient for a batch environment, but for pure interactive work, only realtime accounting is timely enough.

Of course you also require the ability to do the traditional system accounting functions of invoicing, management reporting, auditing, and security enforcement.

### WHAT IS YOUR SOLUTION?

The senior developers at VM Software Inc. have the experience to force an accounting system to meet these needs through extensive modifications to VM internals; but this would be a serious mistake. IBM is moving so aggressively to enhance VM that there is no way to ensure that internal modifications to VM made by an independent software vendor today will operate on the next VM release. This is an assurance you must have: before you acquire any software package. An effective VM accounting system must work within the existing framework of the VM environment, yet allow for future VM growth.

We at VM Software Inc. have developed six products that work together to help you run your VM Information Center more efficiently. VMACCOUNT meets the resource accounting needs discussed above. Perhaps more importantly, VMACCOUNT is specifically designed to grow in sophistication as IBM enhances VM to collect and report more detailed data on system usage. VMSI, as the leading vendor of VM system software products, understands the intricacies of VM and the needs of VM Information Centers. VMACCOUNT is designed to meet these needs, now and in the future.

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## Ecom rate hike turned down

WASHINGTON, D.C. — A proposal to double the rates for Electronic Computer-Originated Mail (Ecom) service was turned down last week by the U.S. Postal Service's board of governors, which said a rate increase would hamper use of the service.

The U.S. Department of Justice had made the rate increase request after declaring that the U.S. Postal Service was unfairly subsidizing its Ecom service with regular mail revenues. In addition, private sector electronic mail service firms have fought the service, saying it represents unfair competition from the government.

Since its introduction in January 1982, Ecom has posted big losses. Use of the service has not met Postal Service expectations.

The independent Postal Rate Commission, which oversees postal rates, had formally asked that Ecom rates reflect the costs of providing the service. This would have doubled the rate for the transmission of the first page from 26 cents to 52 cents and raised the price of the second page from five to 13 cents.

The board of governors said that while there should be some increase in Ecom rates, the Postal Rate Commission should make a more "modest" proposal.



## NEWS

# TI to manufacture National Semi microprocessors

By Peter Bartolik  
CW Staff

NEW YORK — National Semiconductor Corp. and Texas Instruments, Inc. last week announced a cooperative technical effort that will provide TI with high-performance microprocessors and bolster National Semi's marketing strength.

Confirming long-term speculation that TI would seek to fill a missing gap in its semiconductor product line by becoming a second-source producer of microprocessors, the two companies announced here a long-term agreement under which TI acquired the rights to manufacture National Semi's processors, which feature a 32-bit internal processing architecture and external data buses of 8, 16 and 32 bits.

National Semi's 32-bit product line, including the 16016, 16032 and 32032, was renumbered the 32000 series in conjunction with the announcement.

No details were released on specific products that will result from the agreement or of any financial terms involved. However, National Semi spokeswoman Roseann M. Clavelli said the agreement will enable National Semi to offer Cmos versions of its microprocessors and may ultimately lead to Cmos

versions of all the 32-bit products.

Currently, National Semi's 32-bit lineup is produced by the Xmos process, a proprietary version of the Nmos process, but Cmos "is the way the industry is going," Clavelli said.

Charles E. Sporck, president and chief executive officer of National Semi, said each company will contribute its particular expertise to the agreement without sacrificing independence.

"TI strengthens its position in the microprocessor field, and National [Semi] gains a very strong alternate manufacturing source," Sporck said.

Alternate-source agreements are seen by analysts as prerequisites for microprocessor manufacturers to market their products successfully to equipment vendors, who require guaranteed supplies.

In recent years, TI has relied on outside sources to provide microprocessors for its microcomputer products, using the Intel Corp. 8088 in its Professional Computer and the Motorola, Inc. 68000 in the announced Nu Machine.

TI's president and chief executive officer, J. Fred Bucy, said at the press conference here that the agreement provides the potential "for both companies to be major participants in the 32-bit marketplace." National Semi's Series 32000 family could be "a significant alternative for customers needing a high-performance microprocessor," Bucy said.

To date, Intel appears to have captured the lead in the 16-bit marketplace with its 8086, 80186 and 80286 products, which feature a 16-bit architecture and 16-bit data

transfer. Motorola, on the other hand, has scored successes with its 68000 product, which features 32-bit internal architecture and 16-bit data transfer features.

Motorola and National Semi have both announced 32/32-bit products, as has Zilog, Inc., and Intel is expected to introduce a similar product this year.

Michael J. Krasko, an analyst with L.F. Rothschild, Unterberg, Towbin, said the agreement is very complementary to both companies and provides them with an opportunity to gain a leading market share in the 32-bit arena.

"The National/TI combine presents more of a challenge to Motorola than to Intel," he said, pointing out Intel's dominance as supplier for IBM's Personal Computer and its second-source agreement with Advanced Micro Devices, Inc.

Motorola lacks Intel's visibility and strong alternate-source capability but, nevertheless, is a strong company with which to contend, he added.

## They took a lickin', kept on tickin'

By Edward Warner  
CW Staff

RINGGOLD, La. — It was an unplanned torture test that would have made John Cameron Swayze blanch. Two IBM 3680 Store System cash registers in a small department store here endured a tornado and days of lying under rubble in the rain — and neither one cashed it in.

Both machines, part of a point-of-sale (POS) system, are now up and running, even though the cure for one consisted of spending the weekend after the disaster in the trunk of a car.

According to Charlie Shorter, POS systems administrator for W.E. Walker Stores, a tornado tore through Ringgold May 2 and



Busy cleaning the cash registers are (left to right) Ron Washington, Terry Smith and Charlie Shorter, all of W.E. Walker Stores, Inc.

leveled the Walker chain's local outlet, Bill's Dollar Store. The store's cash registers were left in the wreckage, unprotected from the ele-

ments. (It rained at least twice.)

Late the next day, the chain's district manager entered the ruins and found the system's master register, the machine that stored the POS data, and removed it from the debris.

Shorter and the district manager later "turned it on its side and poured the water out." From the mouth of its disk drive, they pulled a mangled diskette. With an IBM technician in attendance, they oiled the machine and cleaned its read-write head.

The machine was then plugged in, and, to everyone's amazement, it worked.

The next day, the district manager returned to the ruins and found the slave register trapped beneath a fallen ceiling beam. He dumped water and debris from the register and tossed it into his car's trunk to dry out. "He let the sun bake it," Shorter said.

Three days later, Shorter plugged in the slave register. It, too, worked.

The two machines are now recuperating on a local workbench. However, they are expected to return to duty when a new Bill's Dollar Store rises from the rubble of its predecessor in July.

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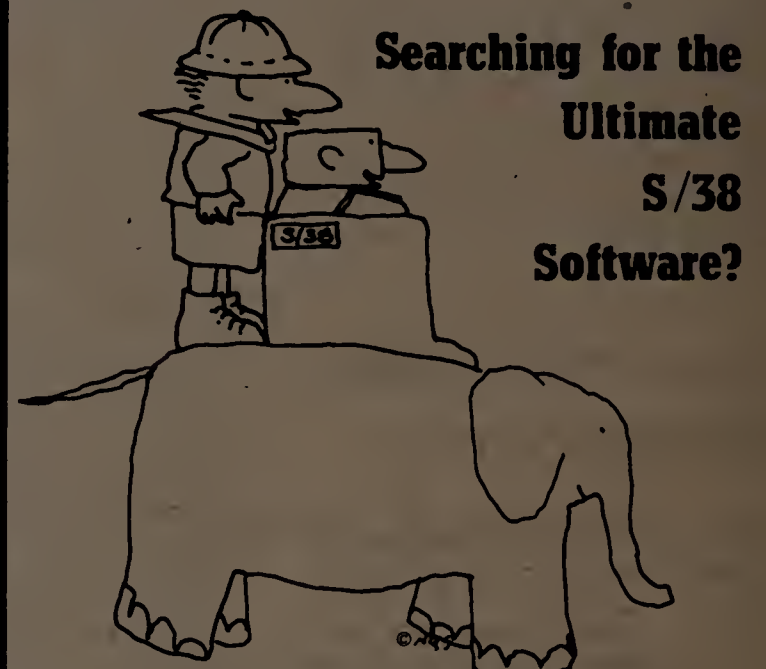
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## NEWS

# Micros 'positive force,' majority of DP managers say

By John Gallant  
CW Staff

PARK RIDGE, Ill. — An overwhelming majority of DP managers surveyed recently by the Data Processing Management Society said micros are a "positive force" in information management, but they warned of an urgent need for top management support in designing and implementing corporate micro policies.

Conducted in March among Data Processing Management Association (DPMA) members, the survey found that fully 98% of DP and MIS managers see micros as an important tool in managing data resources. In that role, micros make a "significant contribution" to the overall goal of providing useful information to employees, DPMA members said.

The nationwide survey, "Micros in the Corporate Environment," published

in this month's edition of DPMA's "Compufax" newsletter, was based on 200 responses from DP and MIS managers, most of whom are employed in Fortune 1,000 companies. The survey showed that an average of 78 micros are currently installed in each of those companies. And, on average, DPMA members said their organizations plan to install another 45 micros in the coming year.

## No formal policies

Despite the widespread use of microcomputers within those corporations, more than half (60.5%) of those surveyed said their organizations do not have formal policies in place regarding the acquisition and use of micros.

Not surprisingly, the major concern voiced by DPMA members was a need for top management support in

establishing those policies.

The DP professionals said micro policies are "urgently needed" to ensure successful implementation of micros and to guarantee consistent hardware configurations and software selection. Compatibility between micros and existing DP systems was also listed as a prime concern by DPMA members.

"Contrary to rumors that they are ignoring this issue, closing their eyes to the increasing use of micros, the survey shows that DP managers have accepted [micros] as part of the corporate information environment," "Compufax" Editor Austin Weber said. "But they are clearly concerned about coordinating micro use. Our membership has indicated that there is a real need for consistent policies. They are looking for guidance from above."

Weber said the appeal for top management

recognition of the need for micro policies was based on DPMA members' growing concerns about compatibility and security. "DP managers are crying out for compatibility — especially with the corporate mainframe. That compatibility is lacking in most organizations. Getting support and involvement from above is also critical for establishing and maintaining security guidelines," he said.

Almost a fifth of the respondents also urged top management to respect a DP manager's advice and give DP "adequate control" in the areas of micro purchasing and application support.

Survey results can be obtained through "Compufax," which is available for an annual subscription fee of \$18 from "Compufax," DPMA, 505 Busse Highway, Park Ridge, Ill. 60068.

# Survey finds DP job outlook for males, females 'better than ever'

NEW YORK — The outlook for both male and female data processing professionals is "better than ever," a recent survey of DP managers and corporate executives found.

Further, data processing is an excellent field for quick advancement, according to the study, developed by

Accountemps, an accounting, bookkeeping and data processing temporary personnel service.

Among the key findings of the survey, whose objective was to gather information from DP managers and executives concerning hiring attitudes and procedures, were:

- When hiring, the qualities data processing managers look for, in order of importance, are prior computer experience, technical expertise, education, personality, job stability and appearance.

- Although a high level of technical skill was considered a requirement for success as a DP professional, both data processing managers and corporate vice-presidents agreed that the ability to get along with people was even more important.

- Seventy-six percent of the top management executives indicated that DP professionals are too computer language- and machine-oriented, and 66% of the data processing managers agreed with them.

- At least 76% of the corporate vice-presidents and 60% of the DP managers believed that top management

should have a working knowledge of data processing.

- Ninety-four percent of all the respondents believe that the opportunities for DPs are greater than they have ever been.

- While 66% of all the respondents said that data processing is an excellent field for men who want to advance quickly, 77% expressed the opinion that it offers that same advantage to women.

- The single biggest complaint DP managers had about top management was that their function and value to the corporation was not fully understood or adequately appreciated.

Further information about the survey, which was conducted for Accountemps and cannot be purchased, is available from Accountemps, 522 Fifth Ave., New York, N.Y. 10155.

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## NEWS

# AT&T, MCI announce business-related offerings

## Include enhancements, rate changes, new services



CW AT ICA

By Phil Hirsch  
CW Washington Bureau

LAS VEGAS — Both AT&T and MCI Communications Corp. announced new business-related communications offerings here last week at the International Communications Association's (ICA) annual meeting.

AT&T added to its Advanced 800 service four features that are expect-

ed to become available next fall. MCI changed its dial-up rates, expanded one recently introduced data transmission service and announced plans for another.

The new AT&T Advanced 800 service features include:

- Call Prompter, which provides a recorded message that routes incoming calls to particular departments. The prompt consists of a recorded message that gives the caller the proper dial code for a department.

- Call Allocator, said to allow a subscriber to apportion calls to two or more call answering locations.

- Command Routing, which enables the subscriber to establish alternate ways for AT&T 800 service calls to be routed in an emergency.

- Courtesy Response, which gives the caller an explanatory message when the called party is not available.

In its announcements, MCI:

- Added 2.4K, 4.8K, 9.6K and 56K bit/sec speeds to its recently introduced 1.5M bit/sec Terrestrial Digital Service. MCI also said the expanded offering, now available in 17 cities, would be extended to a total of 50 cities by year's end. Usage charges for

the 2.4K to 9.6K bit/sec services, based on distance, range from 34 cents to \$1.36 per mile and, according to MCI, are 10% to 13% below AT&T's Dataphone Digital Service rates.

- Announced plans to offer a customer-reconfigurable, integrated services virtual private-line network service within a year. Virtual private-line network circuits will be used part of the time to support MCI's residential dial-up services, which will reduce the network rates, according to the company.

- Revised its Wats tariff, which, if the Federal Communications Commission does not object, will go into effect May 15. The mileage bands and rate steps in the new tariff are said to be directly comparable to AT&T's offering. In addition, call detail reporting will be added to MCI Banded Wats at no extra charge, and billing will be based on six-second increments.

- Dropped all monthly service and minimum charges from its dial-up long-distance offerings and simplified the rates. "Significant savings" for off-net users were promised. The new dial-up tariffs carry a July 15 effective date.

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### T1 from page 1

voice communications manager of Weyerhaeuser Co. in Tacoma, Wash., said that performance and the inherent ability to integrate voice and data traffic are also factors to consider. Later this year, his company will install on a trial basis a 1,400-mile T1 link that will initially be used for voice and then later for some data.

Experimentation, though, doesn't come cheap. Most carriers require users to sign termination contracts. William E. Kane, manager of telecommunications for SEI Corp., a service bureau serving financial industries, said that to get a local T1 line from Pennsylvania Bell Telephone Co., SEI had to make a two-year commitment.

Availability — the lead time required to have facilities installed — is probably the single largest problem with T1. Lead times can range from one to two years, users reported, and in some cases longer. Besides the obvious stress this imposes on managers, it makes it hard to pin down future service costs, noted Jay W. Parsons, telecommunications manager with the Tennessee Valley Authority (TVA) in Chattanooga, Tenn.

The TVA uses some T1 lines now and is looking for other applications. "Where it is available and where it is cost-effective, we'll use it," Parsons said. To his mind, economics is the driving force behind the use of T1, and the increasing price and performance of voice digitization equipment is the driving force behind the economics.

Parsons pointed out that the use of T1 carries with it the danger of losing multiple circuits with a single line outage. Users who operate a number of individual lines will be insured against such a catastrophic hit.

All attendees polled who are presently operating or will soon have T1 lines cut over indicated that they would use the facilities to carry both voice and data traffic. Many cited integration, in fact, as a plus of T1.

\*Tominy's completely portable application development system is presently available for IBM's PC, System/34, System/36, Series/1, 43XX, 30XX, 370xxx, DEC VAX/VMS systems, UNIX and XENIX operating systems



## NEWS

# GTE voice/data workstation bows at show

## Honeywell unveils voice/data PBX; Widcom coder/decoder debuts



CW AT ICA

By John Dix  
CW Staff

LAS VEGAS — It is perhaps no coincidence that the number of exhibitors that were hawking their wares at the International Communications Association's (ICA) annual meeting here last week was up 40% this year, the first year of divestiture. Now, more than ever, the user members of this association are considering the products of the general trade suppliers.

Among the announcements made at the ICA show was the debut of an integrated voice/data office workstation by GTE Communications Systems Corp. Called the Omni-Action, it is manufactured for GTE by Sydis, Inc. of San Jose, Calif. GTE has signed an exclusive marketing agreement for the product and also reported it has acquired a 20% interest in Sydis.

The Omni-Action system is composed of two parts: Omni-Action intelligent terminals and a central applications processor called the Information Manager. The terminals,

which have an integral telephone, offer 10 function keys that change depending on the application in use. These keys obviate the need for keyboards in some applications, but keyboards, a control mouse and other peripherals can be supported by the devices.

### Connected with telephone wire

The terminal/telephone combination is connected with telephone wire to the Information Manager, a Motorola, Inc. 68000, Unix-based system that would typically reside in the same room as the private branch exchange (PBX).

Omni-Action is said to provide users with multiline telephone capability. It also supports a number of office applications that can be tapped simultaneously through screen windows.

Functions include voice messaging, dictation, transcription, electronic mail, directory, message pad, electronic filing, word processing, electronic spreadsheet and data base manager.

Compatible with any PBX or Centrex system, the Omni-Action system costs roughly \$6,500 per terminal supported. It is slated to become available in September.

GTE Communications Systems is

located at 2500 W. Utopia Road, Phoenix, Ariz. 85027.

### Honeywell voice/data PBX

Honeywell, Inc. used the ICA conference to announce a data/voice PBX called the Delta-Plex Series 2000. This is the first product to debut from the Honeywell-Ericsson Development Co., a joint technology venture between Honeywell and Ericsson, Inc. The design and architecture of the switch are that of Ericsson's MD110 PBX, which is said to have a proven track record in Europe.

The digital, nonblocking Delta-Plex Series 2000 reportedly supports 100 to 12,000 lines, expandable in 200-line increments. System growth through the size range is said to be virtually linear, both in cost and hardware requirements.

Data features of the switch include simultaneous voice and data support over a single pair with asynchronous traffic at speeds up to 19.2K bit/sec and synchronous support to 56K bit/sec.

Initial installations of the switch are slated for September or October of this year. It costs \$700 to \$1,100 per line. The company is located at Honeywell Plaza, Minneapolis, Minn. 55408.

### Color pictures over phone lines

Widcom, Inc. used the ICA conference as a stage to unveil the VTC-56, a coder/decoder that reportedly makes it possible to transmit "motion color TV pictures" over a 56K bit/sec telephone line or satellite link. The result, the company claimed, is a transmission cost reduction of approximately 10:1 over competitive products.

The quality of the color picture achieved with the VTC-56 is said to

be similar to that of a home videocassette system.

The device requires no special equipment for operation and accepts conventional black-and-white or color TV signals as input, according to the company.

Delivery of the product, whose price is set at \$75,000, is scheduled for June. Widcom is located at 1500 Hamilton Ave., Campbell, Calif. 95008.

### DDS tester

Teleprocessing Products, Inc., took the wraps off a testing unit that enables AT&T Dataphone Digital Service (DDS) users to do some of their own network analysis. Traditionally, DDS customers have had to rely solely on AT&T to diagnose DDS line problems, which it does through any one of its five centralized DDS control centers.

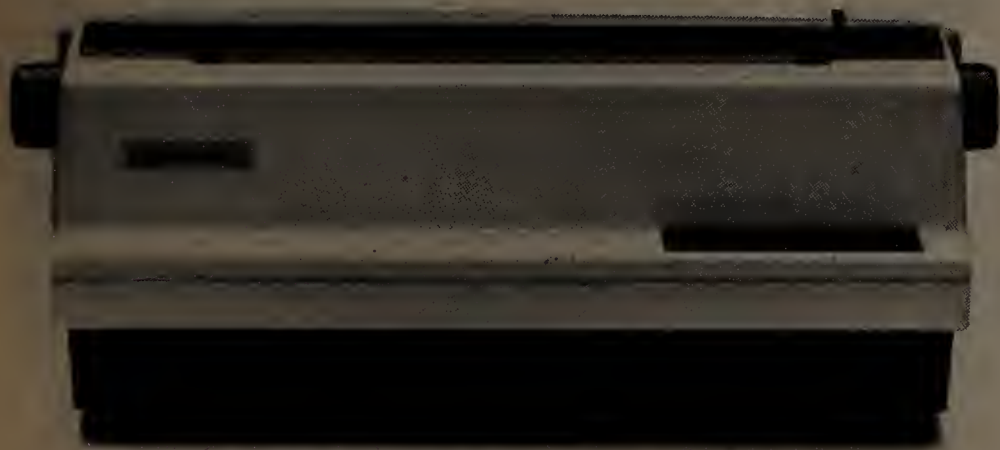
Teleprocessing Products Level One Remote Test, when used with its own digital service unit (DSU) interfaces, enables users to conduct their own diagnostics remotely on polled multipoint or point-to-point DDS lines. Users must provide an Ascii terminal to access Level One diagnostics from the central sites.

Users can perform diagnostics on as many as 1,024 different remote locations on up to 16 DDS links without having to move or patch cables, the company reported.

The system consists of two components: the 16-channel central site test controller, which costs \$2,350; and a \$150 diagnostic board that has to be factory-installed in the DSU interface by the company.

The products are available now from Teleprocessing Products, which is home-based at 4565 E. Industrial St., Building 7K, Simi Valley, Calif. 93063.

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## NEWS

# AT&T deregulation benefits for users debated at ICA



CW AT ICA

By Phil Hirsch  
CW Washington Bureau

LAS VEGAS — Whether users would benefit from the deregulation of AT&T was a hotly debated topic here last week at the International Communications Association's (ICA) 37th annual conference and exposition.

Because of Federal Communications Commission regulatory policies, AT&T's prices are higher than they should be, AT&T Vice-President Larry Garfinkel contended during an ICA session. As a result, all communications users are paying more than they should be paying, he said.

Garfinkel insisted that AT&T bears a disproportionately large share of local exchange costs because of the separations process and will continue to do so after the FCC's pending access charge plan is implemented.

Not only must AT&T charge more, he argued, but the company also creates a "price umbrella" for its competitors rather than giving them an

incentive to price their services closer to costs.

Garfinkel maintained that the huge revenue gains of other common carriers, such as MCI Communications Corp., in recent years stem directly from the extra costs imposed on AT&T by FCC actions. The answer, he added, is to redistribute the local exchange access charge burden and replace the FCC's present "stringent regulation" with "flexible oversight," allowing AT&T greater freedom to offer innovative services and pricing.



Selwyn

But in the same session, economist Lee Selwyn argued that if the long-distance communications market were truly competitive, there would be no price umbrella; suppliers would compete with each other rather than with AT&T. Also, Selwyn added, there would be no queues of users waiting months for AT&T to fill circuit orders.

Selwyn, a consultant, also contended that AT&T, despite a stated desire to price its services closer to costs, neglected to do so last October when given the opportunity.

This was a reference to the FCC's initial access charge decision, under which about \$4 billion in local exchange costs, paid by long-distance

users under the separations process, was shifted to local exchange users.

According to Selwyn, the point was that the transfer of this \$4 billion reduced AT&T's long-distance service costs by approximately the same amount, yet the company proposed new tariffs that passed on only about half of the saving to its customers.

Phil Permut, former deputy chief of the FCC's Common Carrier Bureau and now a partner in the Washington, D.C., law firm of Wiley, Johnson and Rein, said the FCC "appears ready to walk away from" further regulation of the domestic telephone industry and appears ready to rely instead on user complaints and court actions.

## MCI mellows its tone on AT&T

LAS VEGAS — MCI Communications Corp., which in the past has been one of AT&T's harshest critics, appeared to be inaugurating a more conciliatory attitude at the International Communications Association's conference here last week.

President V. Orville Wright said his company "supports the ultimate deregulation of AT&T's basic services. . . . The key question is not whether to lessen . . . regulation of AT&T, but when and how."

Wright proposed a three-stage transition. The first step, "which could be initiated this year, would

eliminate . . . the large number of industry reports required under current rules."

Step two would involve eliminating Federal Communications Commission regulation of AT&T's rate of return and cost of service. This step could occur after "equal access has had its impact throughout the marketplace," and AT&T's share of the long-distance market dropped to "between 60% and 65%."

The final stage — removal of FCC controls over sharing of AT&T service — could occur when AT&T's market share dropped to about 40%.



Wright

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## Users rate good service: keynoter

By John Dix  
CW Staff

LAS VEGAS — In the divested environment, users must insist that their communications carriers provide reliable service and assume end-to-end responsibility for that service.

So said Lee Paschall, chief executive officer of American Satellite Corp., in the keynote address he pre-

sented here last week to the 37th annual meeting of the International Communications Association (ICA). The meeting was touted by ICA as the largest in the history of the non-profit association of telecommunications managers, whose members include more than 1,300 users from 500 organizations that, by rule, spend

See ICA page 15

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## NEWS

# Long lead times forcing private-line users to other routes



CW AT ICA

By John Dix  
CW Staff

**LAS VEGAS** — Many telecommunications users are being forced to seek alternatives to private lines because of the long lead times now required to get dedicated facilities installed.

Polled at the International Communications Association's (ICA) annual meeting here last week, users said they are being quoted long lead times for the installation of private lines. The few users that reported relatively minor problems were those experiencing the least network growth.

Faced with service delays, many would-be private-line users have fallen back on ad hoc contingency plans. Some have pressed dial-up lines into service; others said the delays have

hastened the consideration of bypass technologies.

The Kimberly-Clark Corp. found itself dealing with the private-line delay problem unexpectedly and against its will. The problems started when the company, which manufactures products like Kleenex and Huggies, decided to close a warehouse in Carrollton, Texas, and drop that location as a stopping point for a private line that the company operated between its Neenah, Wis., headquarters and Dallas.

But instead of removing the Carrollton location and providing a direct link to Dallas, AT&T removed the 9,600 bit/sec dedicated circuit altogether and did not restore the service for 2½ months. In the interim, said Patrick J. Hickey, manager of telecommunications at the firm, the company was forced to fall back on dial-up circuits operating at 2,400 bit/sec.

Hickey estimated that the dial-up circuit was more than twice as expensive to operate as the private line would have been. He has formally

asked AT&T for credit to offset the expense.

While this is a rather unusual case, the alternative that the user employed to contend with the situation is not. Bobby Matthews, director of administrative services for Cone Mills Corp. in Greensboro, N.C., said that while his private-line needs have been met fairly well, the company has opted to use some dial-up lines instead of dedicated facilities. The impetus to use dial-up lines stemmed both from delay problems with private lines and a general desire to cut costs at the company, which is a large manufacturer of denim and corduroy.

Another user who fell back on dial-up circuits to fill in the private-line service gaps is Dennis Turner, manager of telecommunications services in the Aerospace sector of Allied/Bendix Corp. Turner said that the need to fill those gaps, as well as the long lead times for private lines, has hastened his company's consideration of bypass technologies, com-

munications alternatives that Turner said would have been looked at eventually anyway.

Bypass options that will be considered include satellite service and private microwave systems. The latter technology is one that Kimberly-Clark has already employed to get around the lead times for private lines. Robert S. Winger, an equipment analyst for that company, said it has installed at an Atlanta facility a microwave link to an off-site location in lieu of a tie line.

Some users have fewer options available to them.

Robert Kilgour, assistant communications administrator at Air France, said that while his network is relatively stable, he is at the mercy of the phone companies when an occasional link does have to be added. Air France maintains a nationwide reservation network and reservation facilities in the U.S., Mexico and Canada. These facilities are also linked to the airline's computer centers in France.

## ICA from page 14

more than \$1 million annually for common carrier billings.

In kicking off the meeting, Paschall cautioned users who are evaluating carriers to look beyond capital resources as an indication of a company's vitality. "Look for vendors

that have experience and a willingness to be there for the long term," he advised.

Turning to bypass technology — a key concern of the attendees, who collectively represent the users most capable of and with the most to gain from bypass — Paschall said that the effect bypass will have on the divest-

ed Bell operating companies has been exaggerated.

The divested operating companies are starting to fight back, he said, and incentives for bypass are not always economic. Other reasons to sidestep the local phone company include a desire to gain more control and increase responsiveness caused by facilities shortages.

Paschall came out against access charges, another key concern of large users typical of ICA members, saying they represent an industry subsidy that big business is being asked to carry.

In closing, Paschall urged ICA members to take a more active role in guiding regulation and the industry. "Come to [Washington,] D.C.," he said. "Don't presume that the powers that be know what they're doing."

ICA President Jack W. Fetzer, who

is with Lockheed Corp., also recommended that conference attendees look to Washington, D.C., when he spoke before Paschall. "Know who your company's Washington [D.C.] representatives are and see that they are fully aware of telecommunications policy matters and how they affect your companies," Fetzer said.

In noting other industry developments, Fetzer went on to say that telecommunications should no longer be viewed merely as a utility, but also should be sold to management as a business resource. "We must look for and suggest to management ways to use telecommunications resources as a part of business strategy."

Fetzer said later that "this can and should be a market-driven industry. Instead, it has been controlled by regulation, which offered limited incentives for new product development."

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## NEWS

## PBX capabilities changing

### Packetized/nonpacketized streams predicted

By Phil Hirsch  
CW Washington Bureau

LAS VEGAS — Private branch exchanges (PBXs) that can accommodate both packetized and nonpacketized digital data streams will be announced before the end of this year, consultant Charles H. Baker predicted here last week. Baker spoke at the annual conference of the International Communications Association (ICA), an organization representing the nation's largest corporate communications users.

Baker, who formerly headed Exxon Corp.'s data communications operations, also said that next October will be a milestone in the development of network standards. The reason: a record number of standards are likely to be adopted by the Consultative Committee on International Telephone and Telegraph (CCITT), the major source of international network standards used by telecommunications administrations around the world.

A standard covering the transmission of digital voice at 32K bit/sec — half the rate now in general use — is among those likely to be adopted by CCITT, Baker said. Such a standard will greatly improve the relative economies of digital voice transmis-

sion in comparison to analog, he indicated.

#### Increasing vendor support

Other standards likely to be approved by CCITT will increase vendor support of the Open System Interconnection model, a functional specification that underlies most of the user benefits promised by future communications network technology.

Baker expects growing use of twisted wire pairs during the next few years for data transmission at 56K bit/sec and below.

Twisted pairs are already ubiquitous, he pointed out, and they provide a relatively simple, inexpensive way to transmit data at the speeds required by the majority of applications.

One result, according to Baker, is that star-shaped networks similar to AT&T's recently announced Datakit system will proliferate.

Datakit typically employs twisted pairs between remote terminals and concentrators and optical fiber between the concentrators and a central node.

## Consultant peers into future of network switching changes

LAS VEGAS — In his talk on "Emerging Technologies in Telecommunications" delivered here at last week's International Communications Association (ICA) conference, consultant Charles Baker gave particular attention to upcoming changes in network switching.

Although Baker said that certain vendors will soon unveil private branch exchanges (PBXs) and central office switches capable of processing packetized

and nonpacketized bit streams, he declined to name the vendors. However, a knowledgeable source at Northern Telecom, Inc. said his company plans to unveil such equipment in September. GTE Corp. is reportedly another likely supplier.

Deployment of Integrated Services Digital Networks (ISDN) and delivery of their related user benefits is directly dependent on integration of packetized and nonpacketized bit streams, Baker pointed out. This is particularly true since "packet switching has been proved . . . to be the most efficient and reliable mode of communications transport available."

But packetized voice transmission is unlikely before the "early to mid-1990s," he added, basically because

conversational communication cannot tolerate the store-and-forward delays in present packetizing technology.

Basic ISDN service probably will be available to users in limited geographical areas in late '86 or early '87, Baker predicted. It is likely to provide full-duplex 144K bit/sec capacity, of which 16K bit/sec will be used for signaling. Later, 384K and 1.5M bit/sec ISDN transmission will become available, he added.

Another key development, Baker maintained, is use of packet technology — for example, AT&T's Common Channel Interoffice Signaling System — to control network switching functions.

A major advantage of such systems is that multiple users can share a common control channel, he explained.

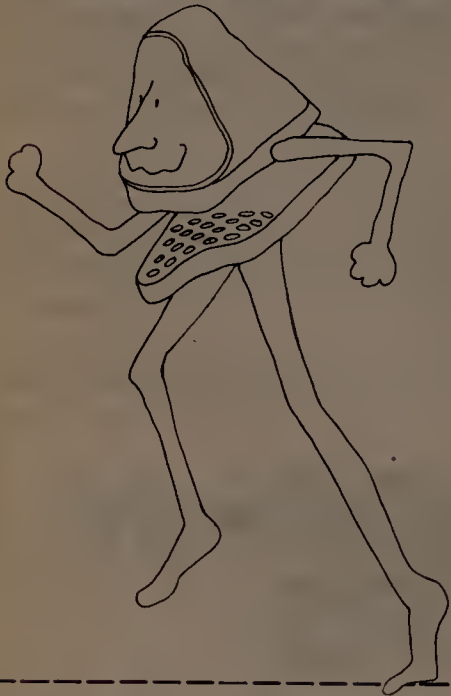
This in turn provides the customer with a means of reconfiguring wideband transmission facilities so that capacity used at one time for, say, voice transmission to a particular city can be used at another time for another application, such as data transmission to a different city.

The result of providing "customer-reconfigurable" transmission, Baker indicated, will be to let more users exploit the economies of wideband and avoid future increases in rates for individual private lines.



CW AT ICA

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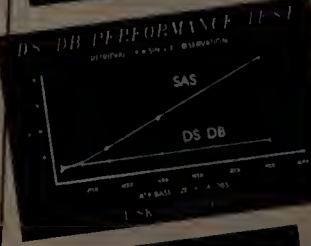
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COMPUTERWORLD







## NEWS

## CODE from page 1

A draft white paper prepared in March at the request of the IBM Share users group and based on interviews with more than 100 users called the object-code-only issue "highly emotional and controversial." The document presents 41 recommendations in 22 areas of concern. Share has not yet endorsed the findings of the white paper.

The Association of Data Processing Service Organizations, Inc. (Adapso) last year published a position paper expressing concern that "some [software] companies, or at least certain products of these companies, will be forced out of the market by this decision" and said the IBM practices "have the potential to be anticompetitive and to constitute unfair uses of market power." Adapso and IBM are continuing discussions on the object-code-only issue, but neither will comment on the status of the talks.

## IBM promises, user skepticism

Indications are that IBM is trying to accommodate users who will be inconvenienced by the restrictions. The vendor said that certain source materials would be made available in controlled situations. It also pledged to add exits and user interfaces to take the place of source code modifications.

However, many users are skeptical that IBM will actually be very responsive to their concerns. Acknowledging that there is little they can do to change the policy, many are eliminating modifications to their systems software in anticipation of an eventual transition to object code only.

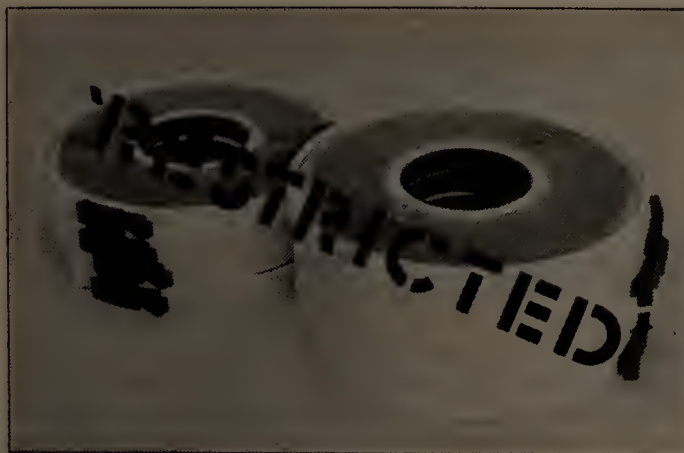
Vendors, too, say they are reducing reliance on the detailed documentation. "If [software vendors] are not shying off from hooks into systems, they're going to be in a world of hurt pretty soon," said Art Cartier, director of product development at Software Technologies and Research, Inc. in Rocky Hill, Conn., an IBM systems and utilities vendor.

"There is a fairly high level of concern among the vendor community," said Oscar Schachter, president of Advanced Computer Techniques Corp. in New York and a member of Adapso's vendor relations committee. "If [object code only] doesn't stop them dead in the water, it certainly implies a considerable increase in costs and time. A problem will arise, and without IBM source, it's very difficult to discern whether the problem is in the vendor's package or the IBM package."

The real battle may be yet to come. The impact

of object code only will probably not be felt for several years as IBM gradually restricts an increasing amount of software that is now source-available. When the IBM programming announcement was made in February 1983, 10 products were identified as object code only. By the end of the year, that figure had swelled to 65, according to an IBM spokesman.

Alarm is particularly apparent in the VM operating system community, which for years has relied on source code maintenance. "Modifying the source is essential to many people," said Romney White, secretary/treasurer of Adesse Corp., a VM systems software vendor in Ridgefield, Conn. "The point of view from the VM community is that you have to be able to fix things if they're broken."



VM is still source-available, but many users fear that the next release of VM, due sometime this summer, will be object code only. The IBM spokesman would not comment on the speculation, but he maintained that "our objective is to implement [object code only] in an orderly manner with minimum disruption to our customers."

The spokesman confirmed that users of the DOS/VSE operating system will probably have to cope with certain source code restrictions when VSE/System Package 2.1.0 is shipped next April. Other popular products now subject to certain restrictions include the JES2 and JES3, SQL/DS and the VM/XA migration aid. And rumors abound that IBM's CICS teleprocessing monitor will go object code only in the next release.

## Small effect on users

It is true that most users have not been greatly affected by the restrictions. For example, a recent survey by the Yankee Group, a Boston consulting

firm, found that only 11% of IBM users make significant modifications to their operating system software. However, those that do modify are often large shops whose activities have a much broader impact.

"A large percentage of the user base is being supported by a significantly smaller percentage," Olin Mills' Clark said. "Users like us are supporting [those who don't modify IBM software] because we're able to make fixes and get in and see where things need to be improved."

On an emotional level, some users resent the implication that IBM can provide software that is suitable for every installation. "We don't think any company can predict what users will want," said Jeff Savit, a Chicago-based consultant. Added Adesse's White, "Users are stuck with IBM's conception of what they need. It's a close approximation, but it's still an approximation."

Some users also fear that the object-code-only restrictions will impact the quality of future IBM software enhancements. They contend that many "fixes" and improvements suggested by users are subsequently adopted by IBM.

"Not only is there a tremendous diagnostic resource in the field, but customers really want to make their software work," Savit said.

Despite the protests, most users are sympathetic to IBM's rationale. In fact, they generally agree that any move away from a dependence on systems programming is a move for the better.

"The overwhelming majority of shops are eliminating local modules. They'd just as soon not have to deal with source," said Richard Schiesser, manager of computer operations at Hughes Aircraft Co. in Fullerton, Calif.

For some users, however, source code is the last line of defense when IBM service centers cannot respond quickly to emergencies. "If we have a problem, our only recourse is to get on the phone and find somebody [at IBM] to talk to us fast," said Gary Schulz, director of computer services at Northwest Industries, Inc. in Chicago. "We're forced to deal with the IBM bureaucracy."

Ultimately, though, users admit that IBM will probably get its way in the object-code-only issue. "People should be bothered, but I don't believe it'll do much good," Adesse's White said.

But Olin Mills' Clark urged users to continue to make their feelings known. "I don't think enough people have raised Cain about this," he said. "We're going to get what we deserve if we won't stand up and be counted."

## IBM's object-code-only practice causing problems for some users

Users who have modified their IBM systems software may encounter problems migrating to new releases that are covered by IBM's object-code-only practice. In interviews with *Computerworld*, two users detailed roadblocks they have already encountered in upgrade efforts.

Northwest Industries, Inc.'s recent conversion from a modified version of IBM's Structured Programming Facility (SPF), which is source-available, to the restricted Interactive System Productivity Facility (ISPF) was "horrendous," said Gary Schulz, director of computer services at the Chicago firm. In order to release source code for certain ISPF modules, "IBM came up with an internal procedure in which you had to sign a kind of license not to release source modules."

The needed modules were shipped on microfiche. "We had to dig up a fiche reader, find the modules we wanted to modify; then IBM sent us the microfiche for only those modules, and we had to send

the microfiche back," he said.

It took almost nine months to get the modules shipped. "During that time, we were sitting on SPF and paying double," Schulz recalled.

Gabriel Goldberg, an IBM VM user who asked that his company not be identified, said his firm is holding back on conversion from IBM's Professional Office System (Profs)/Program Request for Price Quotation to Profs Licensed Product until it negotiates with IBM a way to migrate its modified code to the new product.

"We have modifications we were forced to add in order to meet our needs," Goldberg said. "The new version of Profs is not source-based, and it's not possible for us to carry our modifications forward."

Goldberg, whose company has made more than 50 modifications to VM, is concerned about rumors that IBM's next release of VM will be object code only. "There's no question that putting in an object-code-only version of VM will affect our ability to duplicate the functions we are now offering," he said.

## IBM's attempts to pacify users meet with mixed reviews

Announcing a series of source code restrictions in February 1983, IBM attempted to allay customer fears by specifying that it will provide "user exits to accommodate user extensions, if required." An IBM spokesman said progress is being made in that direction.

Users, however, say that promise has not been fulfilled, at least in some instances. For example, SQL/DS has no accounting facilities and no exits in which they can be added, said Gabriel Goldberg, a VM user who asked that his company not be identified.

Romney White, secretary/treasurer of the Adesse Corp., a VM systems software vendor based in Ridgefield, Conn., agreed. "There are some very fundamental capabilities [of SQL/DS] that weren't provided," he said.

The criticisms have some validity, the IBM spokesman admitted. "We have accepted that there is a need for accounting facilities, and we're working with customers and users groups to determine exactly what their requirements are for ex-

its," he said.

Others, however, maintain that user exits are not an acceptable alternative. For example, a position paper published last year by the Association of Data Processing Service Organizations, Inc. (Adapso) questioned whether an adequate number of exits can be made available under any circumstance.

"Further, because the underlying logic of the object code is not discernable, it is extremely difficult to assess where and how interfaces can be made," the Adapso position paper stated.

"Exits are fine if they're there when you need them and if they're in the right place," commented Pete Clark, systems programming and data base/data communications administrator for Olin Mills, Inc. in Chattanooga, Tenn. "But historically, that has not been the case."

IBM also indicated that its support center staff would be beefed up to handle problems emerging from the source code restrictions. But sources say service levels have

See IBM page 18



## NEWS

## Meet scheduled on integration

ST. CHARLES, Ill. — Arthur Andersen & Co. has scheduled a two-day seminar on "Information Integration: Making the Pieces Fit" for May 31-June 1 at the company's Center for Professional Education here.

The seminar will focus on combining technical expertise with a management perspective. Scheduled speakers include Dr. F. Warren McFarlan, professor of business administration at the Harvard Business School, and J. James Mackie, vice-president of office technology for Mitel, Inc.

The registration fee is \$500. Information is available from the Center for Professional Education, 1405 N. Fifth Ave., St. Charles, Ill. 60174.

## Member of 414s hackers group placed on two years' probation

MILWAUKEE — A member of the group of young computer hackers here known as the 414s was placed on two years' probation last week after pleading guilty to gaining unauthorized access to computer data banks at the Memorial Sloan-Kettering Cancer Center, which is located in New York, and at a Los Angeles bank.

Gerald Wondra, 21, of West Allis, Wis., received a suspended sentence and was ordered to pay a fine of \$500 on each of two misdemeanor counts of unlawfully engaging in interstate commerce in order to access a computer.

Wondra, who is a student at the University of Wisconsin-Milwaukee,

was one of several Milwaukee-area youths who took part in a scheme to use their home microcomputers to access illegally data banks located throughout the country [CW, Aug. 22].

The 414s group of hackers is named after the Milwaukee area code.

At the sentencing, U.S. District Court Judge Terence T. Evans said, "It's important to send a message to Mr. Wondra and all others that this is a serious offense ... with serious consequences."

Evans also commented on the need for more specific statutes to be targeted toward dealing with such crimes.

## Joint R&D gets House backing

WASHINGTON, D.C. — The House of Representatives last week overwhelmingly approved legislation increasing antitrust protection for joint industry R&D ventures.

The bill, strongly supported by the high-tech industry and the Reagan administration, was approved by a 417-0 vote May 1. It is meant to promote activities such as the Microelectronics and Computer Technology Corp.

The legislation declares that joint R&D ventures cannot "be deemed illegal per se." More important, ventures whose members and purposes are disclosed to the federal government in advance cannot be hit with treble damages in civil suits.

## IBM from page 17

shown no noticeable improvement to date.

Clark said it typically takes from eight weeks to three months to get a program temporary fix from IBM, adding, "I'm not comfortable with that lag time."

"You're betting your company on IBM's ability to respond," said Jeff Savit, an independent consultant based in Chicago. Reflecting concerns also expressed by other users, Savit noted that the support center can be "very stubborn about fixes. I've had

cases where software bugs took my system down, and I had to argue with [IBM] about getting them fixed."

However, the IBM spokesman discounted the claims. "People I have talked to are not aware of any customer emergency that has not been addressed satisfactorily by our service centers," he said. "Obviously, if customers have changed code, it's going to take more time to find out what the problem is."

Goldberg added that even if support is available, problem isolation is often difficult without proper documentation. "Sometimes [problems]

only appear far downstream from where the problem really occurred," he said. "You can get into an adversary position with IBM where they're saying, 'It's not broken,' and you're saying, 'Read the code. It's wrong.'"

What are the alternatives? Both users and vendors agreed that some provision should be made for customers to obtain source code if necessary. Adapso has proposed that systems software companies with a need to know should receive specified source code and program logic documentation for a reasonable fee as long as contractual measures provid-

ed protection against abuse. Other users believe IBM has already provided adequate legal remedies for the illegal use of proprietary materials in its existing contracts.

Some users don't argue with an eventual move to object code only, but say that the IBM software needs more modification first. "The software [IBM sells] is not designed to go without modifications," said Gary Schulz, director of computer services for Northwest Industries, Inc. "As long as they're going to sell us that old software, they have to give us the tools to use it."

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## NEWS

# Permanent tax credit for R&D given 50:50 chance

By Edward Warner  
CW Staff

BURLINGTON, Mass. — The federal tax credit for increased investment in research and development, set to expire in December 1985, will be made permanent if a U.S. Senate proposal is incorporated into the coming federal tax increase package. That proposal has a 50:50 chance of approval, a Boston lawyer specializing in high-technology and taxation issues said here recently.

The R&D tax credit excludes from taxation 25% of a firm's increased annual spending on R&D programs over that of its average spending in the previous three years. R&D spending has been deductible from taxable income since 1981 and, according to attorney Bob Birnbaum, this year's changes in the tax code are certain to tighten the definition of R&D to allow only purely innovative programs.

Speaking earlier this month to a meeting of the Chief Financial Officers Group of the New England Chapter of the American Electronics Association, Birnbaum noted that minor product changes or the development of enhancements to existing software will likely no longer be acceptable for the write-off.

## Tax increases

The tax legislation is being put together by a joint House-Senate conference committee from proposals and tax bills referred to it by both houses. The bill that will emerge from the committee is certain to contain tax increases and should receive congressional approval by Memorial Day, said Birnbaum, a partner in the Boston law firm of Foley, Hoag and Eliot.

Continuation of the R&D tax credit is actually one of the few tax cuts under consideration by the committee, which must come up with tax increases to offset the government's projected 1984 deficit of \$184 billion.

The coming tax law's provisions regarding R&D spending will also clearly provide the write-off to start-up firms to cover product development costs and extend it to corporations that have their research done under contract by colleges.

The deduction for R&D spending applies to both businesses and individuals who invest in a business' R&D effort, a provision which has given birth to R&D partnerships of investors seeking a tax haven and possible profit from R&D discoveries. R&D partnerships, Birnbaum warned, will be affected by whatever bill emerges from the committee.

Certain to be eliminated are prepaid R&D investment programs, usually established near tax time, under which investors pool their money and write a check to a corporate R&D program even before the research effort has begun.



Birnbaum

Another likely change in the new tax law, Birnbaum predicted, is the replacement of Domestic International Sales Corporations (Disc) with Foreign Sales Corporations (FSC), a move which he said arose from the opposition

Discs had received from the nations with which the U.S. trades. The use of a Disc, he explained, allows a firm doing business overseas to defer 42.5% of its taxes on overseas sales.

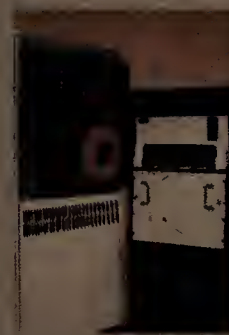
The switch to FSCs, he said, is likely to be approved and will mean that U.S. firms will need to have a "substan-

tial foreign component" in their overseas sales corporations if they want to continue to receive Disc-like tax breaks.

The FSC will likely need to be a foreign corporation and will need to solicit orders and negotiate contracts outside the U.S., according to Birnbaum.

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## NonStop Transaction Processing



## NEWS

# Novel recruiting methods targeting DP professionals

By Edward Warner  
CW Staff

The booming job market for computer professionals has caused some firms to resort to novel approaches to attract applicants. A Pennsylvania firm recently offered tickets to a Philadelphia 76ers basketball game to anyone in data processing who would send in a resume; a Cleveland firm leased four billboards in downtown areas to proclaim that "Opportunity Is On-Line" and offer its phone number.

But the use of hiring incentives has evoked an outcry from others who think the incentives are unprofessional, if not unethical.

"We don't give away any banjos or ski trips or televisions," said Dave Moran, executive vice-president for operations at General Employment Enterprises, Inc., a nationwide placement firm with headquarters in Chicago. The reason is philosophical. "It's certainly a matter of ethics," he said.

One of Moran's competitors, Fox-Morris Personnel Consultants, Inc., took a more freewheeling approach in its Philadelphia office, which several months ago gave away tickets to a 76ers basketball game to DP workers who sent a resume within a certain number of days. "They were good seats, too," remarked Steve

Burns, the manager of the Fox-Morris Philadelphia office's DP recruitment operation.

Burns firmly believes in incentives. In 1980, he gave the choice of a gift certificate, a free vacation or a television set, each valued at \$300, as a "token of appreciation" to persons who accepted DP positions through the agency. "The competition hated it," he said. "You've got to be competitive."

General Employment's Moran, who would like to hold a drawing for a new car for the same purpose, noted that his office's engineering placement branch once offered to job seekers a drawing for an IBM PCjr

microcomputer. Moran stressed, however, that most of the job seekers with whom he works are referrals who come to him on the recommendation of others and not because of the gifts.

One person who does not share the incentive philosophy is Howard Levin, operator of RSVP Services in Cherry Hill, N.J. Levin called any offer of gifts unprofessional and warned that data processing job seekers should not "let something as trivial as a TV set or a vacation be of importance to them."

Levin also charged that some DP recruiting firms have offered upfront money to job applicants who are caught between the salary offers of competing employers. If a recruiter's client firm offers \$31,000 to its applicant and another prospective employer offers \$32,000, the recruiter may be tempted to give the applicant \$1,000 straight from his recruiting fee just to place the applicant with his client.

"That might even be considered a kickback," Levin said. However, he would not name the firms he accused of the practice.

According to General Employment's Moran, recruiters' fees are based on a percentage of the job applicant's first-year income and, for DP job applicants, are always paid by the employer. Moran's firm charges 1% on each \$1,000 of a position's annual pay, up to 25%.

Data processing recruiter Bruce Montville, owner of Exeter 2100 of Hampton, N.H., said his firm has never itself paid a cash bonus to applicants, even though some have asked for it. However, he claimed that some employers are "giving a cash bonus over and above the salary — very quietly."

Both Montville and Fox-Morris' Burns admitted to having placed applicants with firms that paid new employees a bonus for coming on board, but each said he had not paid bonuses out of his own pocket.

## The billboard approach

Meanwhile in Cleveland, a place never flush with data processing talent, Leaseway Transportation Corp., a truck leasing and freight hauling firm, has leased four downtown billboards to entice new information systems employees to the firm, which now employs 150 in that field.

Leaseway had been running classified ads in local papers and computer trade publications but, said its vice-president of information systems, Peter E. Smith, "We really didn't stand out from the crowd of companies trying to attract the same kind of people we are after."

The advertising campaign, which also uses radio spots, has so far brought the firm two new information systems employees, which is double the number it required to deem the program a success, according to its spokesman, Patrick Gallagher.

Gallagher said Leaseway will probably not continue the month-long billboard campaign and will refocus its recruiting efforts on its trade publication advertising, a recent sample of which touts Cleveland as "The North Coast of America," a city that is "the nation's best-kept secret."

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\*Frank L. Chisholm is Cullinet's Executive Vice President. Frank has worked closely with Cullinet users and prospective users for more than six years. As a key member of Cullinet's management team, Frank has contributed heavily to Cullinet's database product development strategy.

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## NEWS

# System/38's potential still not fully realized, exec says

By Jeffry Beeler  
CW West Coast Bureau

SAN FRANCISCO — The IBM System/38 is still a long way from realizing its full potential as a relational data base machine. But the intermediate-scale processor will gradually come of age as Big Blue enlarges its computing horsepower and enhances its ability to communicate with the IBM Personal Computer.

That assessment and prediction comes from William Overhauser, vice-president of sales and marketing at New Generation Software, Inc., a California-based supplier of application packages for the System/38. Speaking here at a recent meeting of

the Association of Small Systems Users, which caters to owners of processors like the IBM System/36, 38 and Series/1, Overhauser predicted the eventual metamorphosis of the IBM Personal Computer into an intelligent workstation, with the System/38 playing the role of departmental host processor.

In the future, he said, "Most of the System/38's processing will take place in the [Personal Computer]," which will then upload its files to the host and update [the bigger machine's] central data base.

Such an advance in the evolution of distributed processing would permit the Personal Computer's un-

tapped computing powers to be exploited to the hilt, Overhauser said. Just as important, the arrangement would also allow the System/38 to offload many of its current processing tasks and thus concentrate on doing what it does best — managing data bases.

The marriage of Personal Computers and System/38s, therefore, will hasten the day when users will finally be able to achieve their ultimate MIS objective of managing data as a corporate resource, Overhauser said.

Although it holds strong appeal, the notion of using a Personal Computer as an intelligent workstation for a host System/38 is technological-

ly impractical, at least at present, according to Overhauser. The two machines are thoroughly incompatible with each other, and the wide gulf between them is unlikely to be bridged soon, "certainly not within the next couple of months," he said.

But the compatibility problem will eventually be overcome, with the result that the Personal Computer will someday have a direct read/write interface to the System/38, he predicted.

## Memory needs

In addition to the ability to exchange files with a Personal Computer, the System/38 needs greatly expanded main memory capacity and internal throughput, Overhauser said.

Introduced in 1978, the System/38 still enjoys the distinction of being one of only a handful of true relational data base machines, he noted. Thus, in theory, the processor already has the ability to join data elements logically, regardless of their physical location — a key feature of relational systems.

But in practice, such a capability requires "lots of computing horsepower" — much more, in fact, than the System/38 currently provides, Overhauser said.

The disparity between the product's potential capabilities and its current limitations prompted Overhauser to liken the machine to an "automobile with all the comfort and convenience features of a Porsche, but with the engine of a Volkswagen."

In the end, he forecast, technical and marketing considerations will force IBM to enhance gradually the System/38, both in capacity and performance, although extremely large configurations of the machine will probably prove unnecessary. As the processor grows, IBM will push hard to turn the System/38 into a "departmental [Personal Computer] for large corporations," Overhauser said. "I already know of one of our own customers who wants to use the machine just to do spreadsheets. But unlike a micro, it will serve 30 to 40 people at a time — and will do the job cheaper than 30 or 40 [Personal Computers]."

Efforts to expand the System/38's capacity will also foster increased competition between the machine and its IBM sister product line, the 4300 series, Overhauser said. At present, the System/38 is still too small to impinge drastically on the 4300's turf.

On the other hand, he added, the two processor families represent different IBM product divisions that compete intensely with each other, in accord with the company's "contention" principle of corporate organization, he observed. That internal rivalry, in turn, has bred a certain amount of tension between the System/38 and 4300 groups.

Overhauser's observations were echoed by another of the conference's speakers, Robin Retallick, president of the U.S. subsidiary of Johnson, Brown & Associates, an international IBM users support group. "IBM's political power base still rests with its large systems people, who are uncomfortable with the System/38, partly because they suspect it might be a good machine," he said.

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## NEWS

# Texas officials clash on county's purchase of micro

By Edward Warner  
CW Staff

ANGLETON, Texas — Here in the seat of Brazoria County government, County DP Director Mike Sandel and County Clerk Dolly Bailey are at loggerheads over processing power.

The county's mainframe can handle all of the county's data processing needs, Sandel said, hinting that the county is wasting its money on the microcomputer it has decided to lease for Bailey's office.

"That's Mr. Sandel's opinion," Bailey responded, saying that the DP director "at one time told me he could not" provide for her department's data processing needs.

Bailey has won out so far. The county has contracted to lease an 8-bit Northern Telecom, Inc. Model 585 multiuser microcomputer for her office at \$3,224/mo for 48 months and will pay a one-time fee of \$7,104 for training, supplies and installation of the new system.

Nevertheless, County Commissioner Billy Joe Plaster has reportedly called for a study to determine why the mainframe, a Sperry Corp. 90/40 with 800M bytes of disk storage and 1M byte of core memory, was bypassed.

The mainframe was purchased four years ago for \$760,000, according to The Associated Press.

"If we continue buying individual computers for each department, we might as well close this one down," Plaster was quoted as telling the wire service.

There is also the matter of costs. According to Northern Telecom, the suggested retail price for the 256K-byte Model 585, with the standard 22M-byte disk storage unit, keyboard and display, is \$19,500 if purchased directly from the firm. Brazoria County's new system, which will include three printers and nine terminals, will cost \$154,752 by the end of the lease's run.

Included in that cost is the expense for leasing the software from

Cott Corp., which the clerk's office will use for keeping and indexing the county's records and for case management of its court system.

Clerk Bailey said the county did examine the differential between leasing and buying the equipment, and decided to lease because of the constant innovations occurring among computer products.

The clerk's office will also save by cutting back on use of its service bureau, Cott, the firm from which it leases the microcomputer. Cott had provided the county with the cross-indexing of its records of births, deaths, marriages and deeds on a monthly basis.

With the arrival of the microcomputer, that service will only be needed every six months, Bailey said.

Bailey couldn't say how much of a savings would occur, but noted that in 1983 the county paid Cott \$31,000 for its services.

Sandel, though, claimed the decision to lease the microcomputer was based on misinformation provided by Bailey to the Commissioner's Court, the county's governing body. "She [Bailey] said she had talked to me and I had said I couldn't handle it. She was wrong," he said.

Sandel also knocked the lease contract, saying it contains no site preparation requirements and no promised delivery date, among other alleged faults.

"For a person who knows about computers, [the contract] is terrible," he claimed.

Bailey, however, stood by the decision of the Commissioner's Court, saying that the court "allowed me to do this, and they wouldn't have if they felt [the county's DP system] was capable of handling the work of this department."

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LAS VEGAS — The future of IBM will be discussed at Caesars Palace here July 12-13 — the Thursday and Friday of the week that the National Computer Conference takes place in the same city — during a seminar sponsored by the Gartner Group, Inc.

Targeted for users, vendors and investors in the information industry, "IBM Futures" will feature Sanford J. Garrett, a vice-president of Paine Webber Mitchell Hutchins; John W. King III of James Martin Associates; and James N. Porter, president of Disk/Trend, Inc.

The seminar will address such topics as the growth rate of IBM, IBM workstations of the future, corporate structure and the large computer market. Speakers will make projections on application software, on-line storage, office integration, large systems, telecommunications and networking, business practices and leasing and corporate organizations, a spokesman said.

Registration for the seminar is \$800. More information is available from Carol Pettie, Gartner Group, 72 Cummings Point Road, P.O. Box 10212, Stamford, Conn. 06904.

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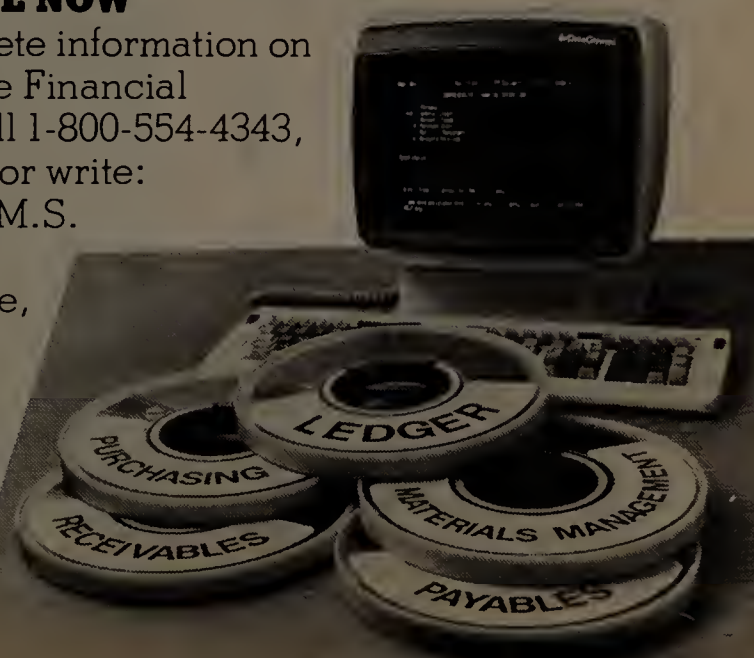
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## NEWS

# Mobile DP center on-site at Venezuelan oil camp

By John Desmond  
CW Staff

MOROCHAS, Venezuela — What cannot be invaded by snakes or insects, is as mobile as a truck container, as efficient as any minicomputer and as comfortable in subfreezing temperatures as in tropical climes?

It's a mobile computer center, developed for an oil exploration firm's drilling camp in Venezuela.

The computer center looks like a tractor trailer when it is mounted on a truck chassis and is actually a truck container that was manufactured for Sante Fe International by the Computer Facilities Services Group (CFSG) of Cypress, Calif. The center has been located on the shore of Lake Maracaibo here for the past two years and is still in use today.

Sante Fe came up with the idea of a mobile center after having bad luck with a previous center in Anaco, Venezuela, according to C. L. Murray of Sante Fe, who oversaw construction of the mobile center. One problem has been that Venezuelan power is "notoriously unreliable," Murray said.

"Parrots took the power down four times in one year. Parrots would fly into the power pole, get zapped and bring the computer down," he added.

Sante Fe wanted the center to be mobile because drilling camps are transient. "It's not like we pick up and move every day, but we might pick up and move every two to three years," Murray said.

The challenge of building the mobile center was met by Bob Brockett and Tony Ard of CFSG. Brockett has an architectural engineering education and contracting experience in raised floors and air conditioning for computer rooms. Ard is a former director of data processing for Ducommun, Inc. and a former computer operations manager for IBM. The two, who formed CFSG in 1975, have built over 500 computer centers in the U.S., mostly in new buildings.

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To meet the need for reliable power, the mobile center was given an uninterruptible power supply system and a generator for a primary or backup power supply. Other features include a powerful air conditioning system, sensitive air filtering, a Halon fire suppression system and access flooring.

Walls were fireproofed, sound-treated and heavily insulated. The center is built to perform in temperatures ranging from 30 to 50 degrees Fahrenheit below zero to 100 to 150 degrees above zero.

Perhaps the most unusual feature is a drain line with screws driven through the sides to impede snakes from slithering toward the heat source.

"We brainstormed about all the conceivable things that could come up," Brockett said. "The goal was to have a mobile data center that would work as well in Alaska as in Saudi Arabia."

The first mobile center was constructed of two truck trailer bodies joined together by a flexible boot. Each trailer is 10-feet wide by 40-feet long with a 13-foot ceiling. (Trailers can be linked together if more floor space is required.)

In Venezuela, one trailer is acting

as a support center for the computer trailer.

Computer hardware, strapped to tracks under the raised floor, is installed before the mobile center is moved on location. Special fittings allow the center to be hoisted off a transport truck onto a cargo ship or even picked up by a helicopter. With computers on board, Brockett estimated, the mobile facility weighs from 13,000 to 14,000 pounds.

Sante Fe installed a Hewlett-Packard Co. HP 3000 Series 48 system to perform administrative work for accounting, payroll, inventory and the drilling rigs scattered over a 50- to 100-mile radius.

No problems have been reported so far at the mobile center in Venezuela. The price of Sante Fe's two-trailer center was \$300,000 without the computer, Brockett said. While he plans now to sell mobile centers outright to any customer, Brockett may consider leasing under certain circumstances.

In addition, Brockett noted, the center could function as a backup system, as a temporary system such as in a leased office, as a practical alternative in remote locations or as a way around import rules that sometimes hinder construction of computer rooms in foreign countries.

The center may also be useful in

politically sensitive areas, such as Iran prior to the 1979 revolution. Brockett suggested that if some American companies had mobile centers at that time in Iran, millions of dollars in data and hardware that were lost could have been saved. "This works well when you have to pick up all your data and head for the border," he said.

Although he has no competitors now, Brockett expects other companies to copy his idea. "It's not really patentable," he said.

As for the immediate future, Brockett said his most likely market for the mobile center is Sante Fe International's drilling division.



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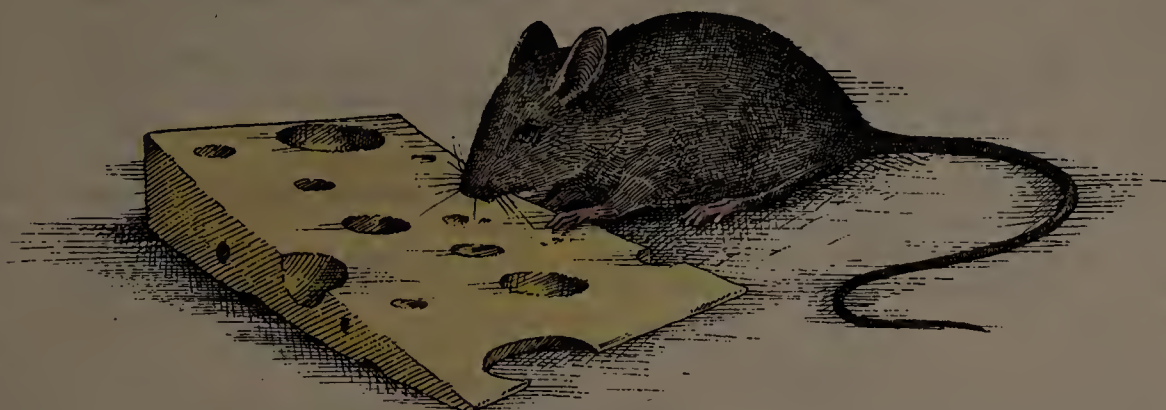
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## NEWS

# Singapore Airlines opens \$17 million computer center

By Chris Galloway  
Special to CW+

SINGAPORE — Singapore Airlines, which professes to have "the most modern fleet in the world," can now also boast the most modern computer center in Asia.

Fully operational as of last month, the airline's new \$17 million center is located near the international airport here and presently houses six CPUs, which cost an additional \$5.9 million. The installation comprises two IBM 3031s, an IBM 3033, a National Advanced Systems, Inc. NAS 7000 and an Amdahl Corp. 5850, as well as a leased Amdahl 470V/8.

The systems provide a combined

processing power of 18 million instructions per second (Mips), with 46M bytes of main memory and 5.1G bytes of attached disk storage, according to Dr. Cheong Choong Kong, Singapore Airlines' director of management information services.

Singapore Airlines' computers run on two main IBM operating systems, MVS and ACP. MVS supports I.P. Sharp Associates, Ltd.'s APL and other on-line applications such as aircraft maintenance and engineering information, personnel, catering requirements and flight and crew management, as well as batch statistical and billing systems. ACP supports on-line reservations, departure con-

trol, message switching and related systems.

The computer center is backed up by emergency standby generators that can sustain computer operations for three days; it also has banks of batteries that can do the same job for 15 minutes. Uninterruptible power supply systems will not only bridge the lag between a power failure and the time it takes the standby generators to get up to speed, but also convert the 50Hz power supplied by the public utilities board to the 400Hz supply required by some of the larger computers.

The airline's computer operations, which today support more than a

dozen major real-time applications and about 2,000 terminals in 64 cities around the world, got its start back in 1965, when Singapore Airlines acquired its first computer, an IBM 1440 equipped with two disk drives, a printer and a card reader. The computer center was located in the airline's downtown headquarters and measured only 60 sq meters.

As time went on, it became increasingly difficult to improve the electrical, air conditioning, fire prevention and security systems in the old building. The expansion of computer operations eventually precipitated the move to Changi, a rural area outside of Singapore.

Relocating the center to Changi took place in three phases this spring. The first saw the moving of massive tomes of systems documentation. The second phase called for the removal of the MVS-based systems to the Amdahl 5850. From the end of February to the end of March, the airline was operating at both sites, with MVS applications running at the new center and ACP at the old building. By April, the operations were completely switched to the new site.

Besides the mainframes at the new computer center, Singapore Airlines relies on a network of minis and personal computers in its offices here and in London, Amsterdam, Frankfurt, Hong Kong and Sydney, Australia. These offices use IBM System/34s for billing, stock control and check writing applications.

Further, the airline's headquarters uses a Wang Laboratories, Inc. Wang VS 100 system, which supports 60 terminals for accounting, and the airport duty-free shop uses two NCR Corp. 8250s for back office control of its point-of-sale equipment.

In addition, the company's recently launched office automation project has resulted in the acquisition of IBM Personal Computers for personnel, flight operations and general processing in the cities not served by the IBM System/34s. "The general idea is to use [IBM Personal Computers] with standard software. We already have six [Personal Computers] in the training department and we plan to double that number soon, but until we sort out our strategy, we will not be getting [Personal Computers] in great quantities," Cheong explained.

## Additional benefits

Benefits of the airline's computers are not confined to direct end users and the computer staff, Cheong said. Just over a year ago, the airline established an information center, staffed with five professionals from its computer division, and placed a strong emphasis on computer training for any interested employees.

Since the training program was initiated, some 250 employees have attended courses.

So far, about a dozen programs have been developed by users working with the information center staff, including a cash management program and a fuel-costing application.

Galloway is editor of The Asian Computerworld, the Asian affiliate of Computerworld, which originally carried this story. The article was made available through the CW International News Network.

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## NEWS

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## AUSTRALIA

MELBOURNE — Software linking IBM Personal Computers to a host IBM mainframe has been selected over an IBM 3270 terminal configuration by the Mutual Life Association of Australasia Ltd. When the system is fully implemented in the company's CICS environment, the Personal Computers will print checks with data that has been downloaded from mainframe files via the Tempus Link package from the Canadian company Micro Tempus, Inc.

## BELGIUM

BRUSSELS — Paula D'Hondt, the government minister responsible for regulating the Belgian postal, telephone and telegraph (PTT) administration, declared recently that the monopoly of the Belgian PTT must be broken. The digitizing of networks enables more than one vendor to sell telephone exchanges to the PTT, D'Hondt said, and the PTT must open up its doors to other vendors besides ITT, which had been the exclusive supplier of equipment to the PTT. Recently, the French CIT-Alcatel was selected as a second source of technology for the PTT.

## JAPAN

TOKYO — Alps Electric, a manufacturer of electromechanical components here, has begun developing an on-line system to integrate the three-pronged process of production, sales and delivery. The system is based on Toshiba Ltd.'s Office Automation Kernel System and will take the form of a horizontal distributed processing system, hooking together systems with a local-area network.

TOKYO — Sord Computer Corp. of Japan and P.T. Panasatek Corp. of Indonesia recently reached an agreement in principle for the joint development and production of micros.

## THE NETHERLANDS

AMSTERDAM — Philips Information Systems, Inc. and Thomson-Brandt are said to be negotiating the joint development and marketing in Europe of a home computer priced at under \$700. The companies are already involved in the joint R&D of cellular radio technology and are also talking about the future development of videodisk, compact disks and tubes for digital televisions.

AMSTERDAM — A government survey has shown that Dutch scientific and technical institutes are in dire need of more supercomputer processing power. Many test projects, according to the survey, have outgrown their computers' capacities and must look elsewhere for the power to continue their research. In Rijswijk, for example, Shell Oil Co.'s Cray Research Co. Cray-1 supercomputer is currently being used by the European Nuclear Research Center,

as well as by other end users.

AMSTERDAM — Dutch-authorized dealers of the IBM Personal Computer reported an acute shortage of Personal Computer XT models. According to a Dutch IBM spokesman, the IBM assembly plant in Scotland that supplies most of Europe with IBM products cannot get enough of the Intel Corp. 8086 microprocessors necessary for production, but the company expects improvements in the coming month. In the UK, it was reported that dealers were reduced to a 25-per-month ration of Personal Computer XTs.

## WEST GERMANY

MUNICH — Leftist organizations

in the Federal Republic of Germany have developed an increased interest in data processing centers. Security authorities here claim there have been a dozen recent terrorist attempts to disrupt the DP operations of firms that are thought to be working for the government. A list allegedly targeting 300 companies' DP centers was reportedly found during a recent raid on an apartment believed to be a center for the conspiracy.

BONN — Antinuclear computer scientists here are rallying to unite the European scientific community with their cause. The group, sponsored by the peace movement organizers from the German Society for Mathematics and Data Processing, recently convened here at a meeting

that drew approximately 3,000 inquiries from the European scientific community. The movement has targeted for scrutiny very high-speed integrated circuits technology and the use of robot warfare. The group has been joined in its efforts by the Computer Professionals for Social Responsibility, based in Palo Alto, Calif.

FRANKFURT — Fujitsu Mikroelektronik GmbH has had its problems lately. While many microcomputer makers are putting their machines in storage, this company reportedly cannot provide its distributors with adequate numbers of its product. In addition, the German subsidiary lost its European marketing and sales manager and its central European sales manager.

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## NEWS

# Japanese firms banking on micros

First step in program aimed at total on-line transactions

By Katsumi Tanaka  
Special to CW†

TOKYO — If you can't bring your business to the bank, why not bring the bank to your business?

Major Japanese banks have started offering on-line banking transaction services to business firms by means of personal computers. According to analysts here, this is the first step in a comprehensive program aimed at total on-line banking transactions.

A year or two ago, banks were planning to achieve total on-line transactions within a five- or 10-year span.

However, certain developments and projects — the introduction of the Information Network System from Nippon Telephone & Telegraph, for example — coupled with the general deregulation of the communications industry prompted many banks to offer on-line services earlier than expected.

When on-line banking services were first offered in May 1983, there was very little interest from users. The amount of information offered by the banks on the services was minimal, and the participating businesses had to write and maintain their own software to use the service. In addition, the services were originally offered via a connections. The small machines make it more cost-effective for firms to participate in on-line transactions,

Recently, personal computers have attracted attention as the logical vehicle for on-line transactions. The small machines make it more cost-effective for firms to participate in on-line transactions, as they do not have to incur heavy expenses, and the software can be distributed from the banks in the form of floppy disks. Industry watchers predict that the cost savings realized with personal

computer banking, coupled with the ease of using the on-line services, will quickly increase the number of users.

The basic services offered via the on-line transactions include:

- On-line deposit, withdrawal and transfer of funds.
- Financial information distribution.
- Software to utilize and analyze information relevant to the needs of individual firms.

The key to success appears to be the quality of the software and the financial information offered. Further, as more banks start offering basic on-line services, they will also have to start offering something better or different from the others to attract customers.

The problem now facing those offering the on-line services is whether or not to charge for them. The users are strictly large corporations, only a few of which are actually paying service fees.

The reason more banks don't charge is that they don't think it is cost-effective to charge service fees until the customer base increases to a three-digit figure.

One Japanese banker pointed out that in the U.S., only one out of five firms participating in on-line banking services pays service fees.

However, the key to charging service fees lies in whether the banks can convince more customers of the merits of on-line transactions. Banks must prove to customers that a productivity and efficiency increase will result with on-line services in order to justify their investment.

*Tanaka is the managing editor of Computerworld Japan, where this article originally appeared. It was made available to Computerworld through the CW International News Network.*

## Banks wooing on-line users

TOKYO — Daichi Kangyo Bank here began offering on-line transaction service last November. The service consists of on-line deposit, withdrawal, transfer and distribution of financial information.

Daichi Kangyo's software was developed with the help of computer manufacturers and follows the Japanese Chainstore Association (JCA) standards.

Presently, Daichi Kangyo has 30 firms using its on-line service and plans to increase that number to 5,000.

Fuji Bank, also in Tokyo, has 50 users and plans to increase that number to 3,000 with the use of innovative application software and an aggressive marketing strategy. It began offering the service last October.

Sumitomo Bank here began offering the service in November and now provides the most complete application software, capable of analyzing financial information for its users. Mitsubishi Bank, which started its service in October, also offers software similar to that offered by Sumitomo Bank.

Tokyo Bank began offering its on-line service last November and uses the communication protocols of JCA, as well as the data format agreed upon by the association.

By using the Cash Management System financial software offered by these banks, the user can graphically analyze his financial data.

This feature reportedly eliminates the need to develop software privately for financial analysis.

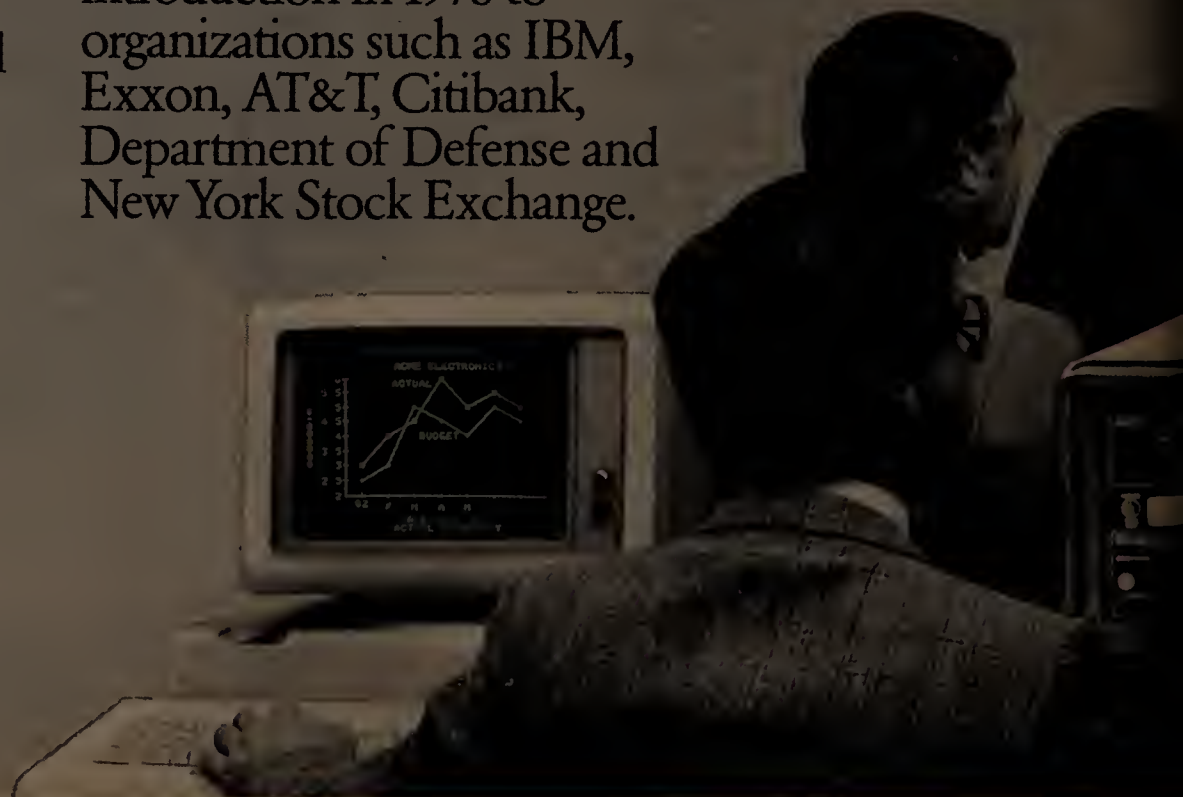
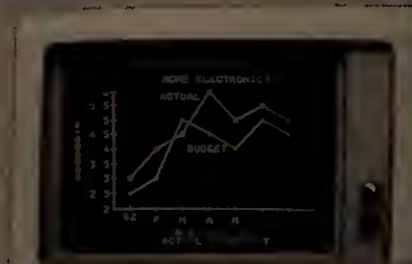
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## NEWS

# CATV future as communications service seen dim

Clouded by need for equipment changes, voice/data regulations, industry watchers say

By Lynn Haber  
CW Staff

Because of the regulatory clouds hovering over the issue of whether the CATV industry can supply voice/data services, cable's future as an alternative communications service appears bleak, industry watchers said in recent interviews.

"Prior to having some resolution of the regulatory issue, many cable companies are unwilling to commit the capital resources involved in offering two-way service," explained Sherry Gettes, director of communications systems with Strategic, Inc. in San Jose, Calif.

She suggested that this, in large measure, is responsible for slowing down the growth of the cable industry in the marketplace for telephone network bypass services.

## Equipment changes necessary

Not only must all of the technology be in place for operation of a two-way cable system capable of transmitting voice and data, but also cable companies must make major changes in their head-end equipment, according to Gettes.

Such equipment changes include adding the necessary computer equipment that is to be responsible for what runs on the nonentertainment cable and establishing data processing departments, which the cable

*At issue for the cable industry is not only what the cable companies can do for themselves, but also how the competition shapes up. 'How effective are the various bypass technologies going to be? If effective, they're going to clobber the cable companies before they can get themselves together.'* — Sherry Gettes, director of communications systems with Strategic, Inc.

companies don't have now.

According to Gettes, two-way voice/data service is a viable option for CATV networks, but whether the industry can get its act together before the communications marketplace is devoured by other vendor businesses continues to be in question.

"We see the window of opportunity closing by about 1986," she said. "If the cable companies can get together and provide a united front on the regulatory issue and figure out what they're going to do in terms of capital expenditure issues, then it can be done."

Also at issue for the cable industry is not only what the cable companies can do for themselves, but also how the competition shapes up. "How effective are the various bypass technologies going to be?" Gettes asked. "If effective, they're going to clobber the cable companies before they can

get themselves together."

Traditionally, the cable industry has shown reluctance to try anything new, according to Bob Patrick, who is director of business communications and services with Cox Cable of Atlanta.

"Most cable companies are not inclined to do this business because it's difficult and unknown," he said. "Traditional cable TV is vastly easier, and as long as there are easier businesses, most are disinclined to do the hard business."

Capital expenditure is not the only issue when CATV firms consider entering the two-way communications marketplace; other concerns exist as well. "You're stepping into a world of regulation, intense competition and cruising head-on with the [divested] Bell operating companies," Patrick said. "And these are genuine things to be concerned about."

According to estimates made by

Bell Laboratories, the data service market is projected to increase at the rate of 20% per year.

"There's a need for two-way voice/data service in the real world," Patrick said. "But only time will tell whether these obstacles can be overcome for cable TV network operators to grab a significant share of the communications marketplace."

In New York, where Manhattan Cable TV operates the largest CATV-type data network, Carl Gambello, the company's director of corporate development, expressed confidence in the continued need for the type of cable service his company offers, despite the implementation of major bypass telecommunications projects presently under way for the business-intensive island.

## A shared marketplace

"I think that the marketplace will be shared by a whole slew of people," Gambello said.

"There's a way for cable to establish a niche for itself because based upon certain applications, it will be decided by users that cable provides a sufficient number of advantages for them to use it," he added.

The future of two-way cable services presently lies in wait for the establishment of rules by which the cable companies will be able to compete in the bypass marketplace.

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## NEWS

## ICA seeks more protection for AT&T terminal users

WASHINGTON, D.C. — Although the Federal Communications Commission has given users of AT&T-supplied terminals two years to decide whether to retain the equipment, and although AT&T has announced that its lease charges during this period will be based on a "price predictability" program, users will get far less protection than promised if the FCC does not take further action.

So said the International Communications Association (ICA) in a petition it submitted to the commission late last month.

The ICA petition accused AT&T Information Systems — AT&T's terminal marketing subsidiary — of telling its customers that the two-year transition period mandated by the commission began Jan. 1, even though AT&T allegedly did not begin providing detailed sales prices until March 1. "Based on a survey," ICA added, "close to 100 [of its members] continue to experience frequent delays in obtaining pricing information."

The ICA asked the FCC to extend the transition period so that users will have "the required full two years" to evaluate sales and lease options for in-place terminals. It also said the commission should order deferral of higher lease charges AT&T is scheduled to impose on July 1.

### Other charges

The ICA also accused AT&T's terminal marketing subsidiary of several other practices that allegedly violate the FCC's December order.

For example, it said AT&T Information Systems is using confusing product codes that prevent users from making meaningful purchase vs. lease comparisons.

Another alleged violation

of the commission's ruling was described in a letter accompanying ICA's complaint. Addressed to the FCC, the letter came from Safeco Insurance Co. in Seattle, which has been renting a Dimension 2000 private branch exchange since April 1981.

## AT&T asks OK for rate reduction

WASHINGTON, D.C. — AT&T has asked the Federal Communications Commission to approve a plan enabling business and residential subscribers to obtain reduced rates for station-to-station long-distance calls made during evening and weekend hours.

Known officially as the

Block-of-Time Optional Calling Plan, it is called the Reach Out America plan by AT&T in its promotional literature.

The reduced-rate proposal consists of two options for subscribers:

Under Option A of the proposed plan, the subscriber can make one hour of station-

to-station long-distance calls for \$10 a month during the off-peak hours. Additional calls during the month will cost \$8.75 an hour.

Under Option B, which costs \$1.50 more, the user will get an additional 15% discount on all station-to-station calls made during evening hours.

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## NEWS

# Aid to nontechnical users seen key to automation success

By James Connolly  
CW Staff

TORONTO — End-user support should begin with user input at the system design stage and continue well after a system goes on-line, the Association for Systems Management (ASM) was told here recently.

"What we're doing is tak-

ing the paper away and telling the employee, 'This is how you do your job now — with a keyboard,'" said Vicki McConnell, president of the McConnell Group of Palos Verde, Calif. The consultant

on system implementation



Photo by J. Connolly

McConnell

and employee training warned attendees at ASM's Annual Conference that the typical user has to deal with awkwardness, fear, suspicion and the computer-language barrier when automation arrives.

McConnell noted that most

working people over age 25 are uncomfortable with a computer terminal in front of them, fearful they will "push the wrong button and blow it up," fearful the computer will take their jobs, suspicious of the computer's dependability and intimidated by computer jargon.

The awkwardness prob-

lem can be overcome with time on the system, just as people overcame awkwardness with telephones through regular use, McConnell said. But she warned that the end user has a "very real fear, a legitimate fear" of losing his job when a computer is installed and that organizations must plan to retrain displaced people.

Along with that fear, the end user is suspicious of the computer's reliability, she said. She cited the example of the office worker who documents each computer error or breakdown, while boasting of his own dependability in a manual system.

McConnell told her audi-

*Successful implementation can come about only with adequate documentation and human communication.*

ence of system managers, representing U.S. and Canadian businesses, government and educational institutions, that a compromise is needed, with potential end users learning more about computers and DP professionals better understanding business. "Many people still don't understand the difference between a data base and second base," she added. She urged computer professionals designing systems first to talk to future end users and ask them how they do their jobs, because a system should be designed to be compatible with how people already work.

Systems designers must market their systems not only to management, but also to the users, and they should do so a month or more before implementation, McConnell suggested.

That marketing effort, meant to relieve users of some of their earlier fears, should be followed by education and training programs that not only focus on how to operate the system, but also stress how the user fits into the whole system.

Also, successful implementation can come about only with adequate documentation — documentation that the nontechnical person can use — and human communication.

McConnell warned that if organizations don't deal properly with the people problem, they can lose their competitive edge, lose the effectiveness of their employees, wind up with unused or underused computers and see equipment damaged by vandalism or misuse.

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## NEWS

# Drug firm gets a shot in the arm with on-line data base

## Gains more control over its product distribution and traffic costs

NEW YORK — A Fortune 500 pharmaceutical manufacturer here has gained more control over its product distribution and traffic costs since it moved to an on-line transportation information and freight payment system.

Sterling Drug, Inc.'s Pharmaceutical Group manufactures such well-known consumer products as Bayer Aspirin, Phillips Milk of Magnesia and Neo-Synephrine. The company maintains manufacturing plants across the country and eight distribution centers from which its more than 400 over-the-counter and pre-

scription pharmaceuticals are shipped.

Sterling Drug spends more than \$16 million annually in freight costs, yet, until recently, its freight payment system was manual. "Try to imagine 400,000 pieces of paper — including freight bills, bills of lading and receiving reports — coming into our Centralized Traffic Department here each year," Francis Watson, general transportation manager for Sterling Drug, said. "We had to sort them, match them, coordinate them, rate them and pay all our bills. Then we had to check all the coding for our financial reports." Sterling Drug was

monitoring carrier costs.

But Sterling Drug wanted more immediate access to its freight bills and bill of lading payment records, as well as access to class, commodity and air rates for other payment purposes. The answer, Watson said, was the Numerax IV on-line transportation information system.

The Numerax IV system utilizes an IBM Model 3101-terminal and a modem, Watson said, and it gives Sterling Drug on-line access to all its tariff and historical information residing in Numerax's data base. "We gained access to our class and commodity rates. Instead of having some-

one manually check a rate from point A to point B, we just key it up on the terminal. That allowed us to reduce our tariff files and assign our file clerk to more productive work. We also cut down on our tariff subscription costs

and freed up a lot of expensive space."

Numerax IV also gives Sterling Drug the ability to trace freight bills and bills of lading, allowing the firm to check on the current status of any freight bill or bill of lading it has issued or paid. It also provides information on freight shipping patterns.

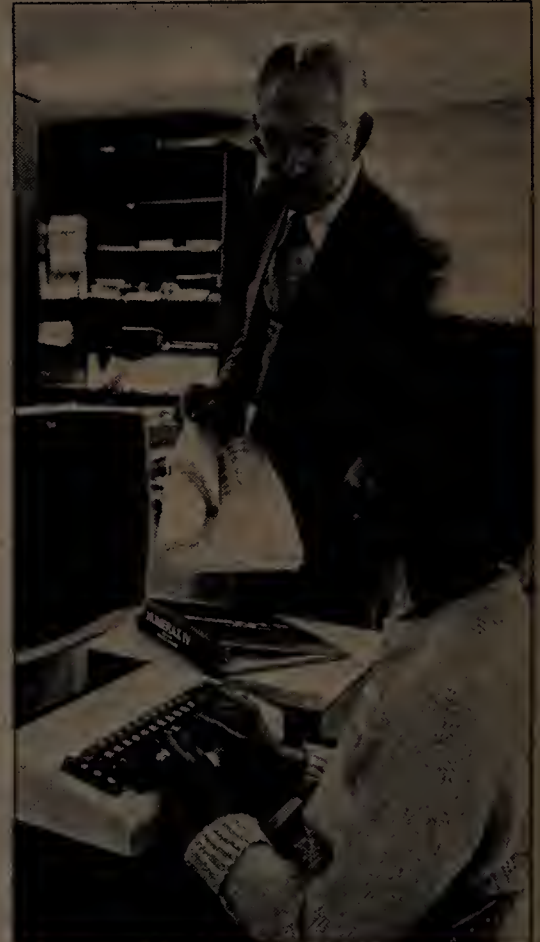
"We're capturing lots of information now that we can use to manage our distribution and traffic better," Watson said. "For instance, I now know how much business we do in one city — say, Birmingham, Ala. I can get that information by weight breaks, how many shipments we make there, what our transportation costs are and so on. I can then determine whether we should be servicing Birmingham from our Atlanta distri-

*'We're capturing lots of information now that we can use to manage our distribution and traffic better.'* — Francis Watson, general transportation manager, Sterling Drug, Inc.

constantly concerned about adequate staffing for the distribution center, yet cost was becoming a real problem. More importantly, management felt it just was not capturing the information it needed to control the distribution and traffic functions.

As a result, Sterling Drug first turned to Maywood, N.J.-based Numerax, Inc.'s Transportation, Auditing, Reporting and Payment System (Tarps). According to Watson, Tarps is essentially an out-of-house accounts payable service through which Numerax processes and pays Sterling Drug's freight bills on its IBM mainframe computers.

In addition, Numerax audits and verifies each shipping invoice, provides a monthly accrual statement and compiles for Sterling Drug a data base of product, customer, origin, destination and carrier data. Tarps also provides Sterling Drug with financial information for fiscal month closings, and it gives the firm distribution information that helps in



Numerax IV allowed Sterling Drug to gain access to its class and commodity rates.

bution point or whether it would be more efficient to warehouse there."

Watson said Numerax IV also eliminates the expense of filing supplements and obtaining rate information from the carrier. The system also gives Sterling Drug individual carrier statistics reports.

"I now know how much business we do by carrier so that when a carrier salesman calls on me, I can talk to him more intelligently insofar as the value of the business we do with him is concerned. The system is an asset in negotiating and analyzing claims situations relative to business done," Watson said.



### How Marvin Schumer and Kalman Shor Made The Micro To Mainframe Connection

Marvin Schumer (left) is the DP manager for EIC/Intelligence, Inc., the leading online database service and a major company in the fields of robotics, genetic engineering, energy and the environment. Kalman Shor (right) vice president of K.M. System Support, is EIC's communications expert.

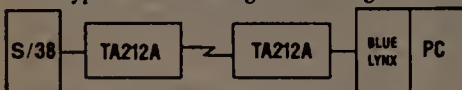
Marvin and Kalman had a timing problem to contend with: their office building (located in Mid Manhattan) closes at 7 p.m. sharp.

"We were cut off from our IBM System/38 on evenings and weekends. As programmers we were frustrated." BLUE LYNX™ made the affordable difference.

"Our programmers now each have BLUE LYNX-equipped IBM Personal Computers at home," Marvin says. "They can now do program development at night and on weekends."

Since the S/38 runs under Release 4.1 of CPF, his crew wrote its own program to pick up dropped lines for optimum unattended operation. (Note: Under release 5.0, lines recover automatically.)

A typical EIC/Intelligence configuration:



Use of PC's with BLUE LYNX won't be limited to the firm's DP staff. "All sales people will be getting into this program," Marvin says, "for customer inquiries and sales-call analysis."

"The technical support from Techland has been excellent," he adds. "BLUE LYNX was installed in April, after we evaluated alternatives including protocol converters. Our second BLUE LYNX took 5 minutes to install."

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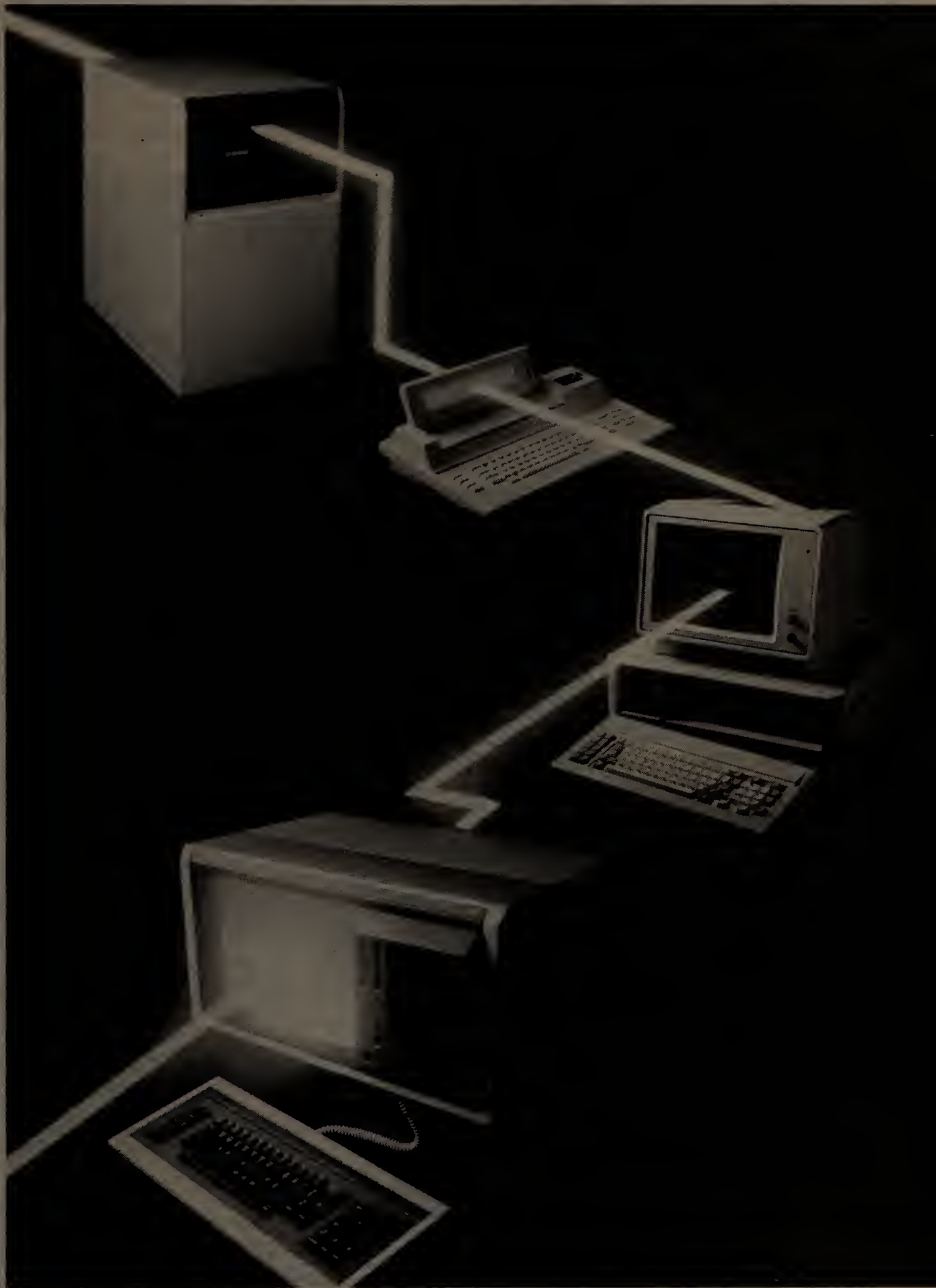
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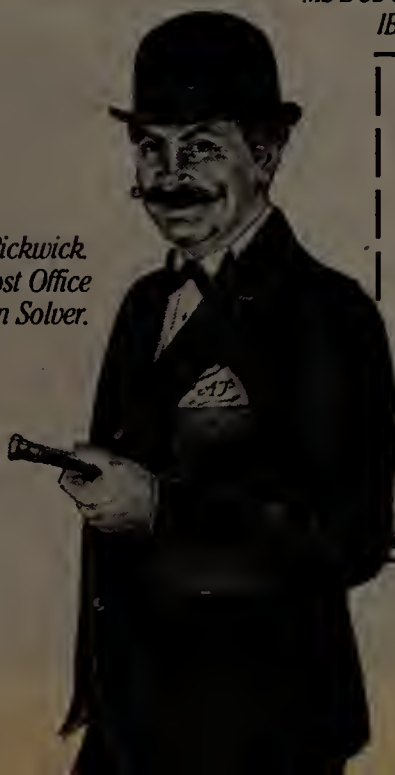
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## NEWS

# CAD/CAM cuts design errors for array processor firm

BEAVERTON, Ore. — A manufacturer of array processors here has reported sharply increased productivity and fewer design errors after installing a computer-aided design and manufacturing (CAD/CAM) system.

Four years ago, Floating Point Systems, Inc. decided that in order to maintain its growth rate in the array processor market, it would have to purchase a CAD/CAM system to handle the design of its printed-circuit boards. "Manual design was strangling the development process, and the cost of outside services was reaching prohibitive levels," explained Len Van Regenmorter, the company's engineering services manager.

The company decided to evaluate various manufacturers' printed-circuit board systems. In the process, Floating Point developed a benchmark that required CAD/CAM vendors to design what the firm claimed was one of the largest circuit boards ever attempted. The board measured 303 square inches and consisted of 525 equivalent integrated circuits, a density of .57 square inches per circuit, 10 layers (eight-track layers and pow-

er and ground planes) and a 25mm grid.

Floating Point then invited some CAD/CAM firms to design the board. The only vendor to accept the invitation was Racal-Redac, Inc. of Westford, Mass., which completed the board layout in three weeks, a Floating Point spokesman said.

Floating Point decided to purchase the Racal-Redac product. After installing Racal-Redac's Color-Maxi workstation and DSM-2 CPU, Floating Point was able to reduce its 25-week product development period — for boards with a density of 0.5 square inches per integrated circuit — to about eight

weeks. More recently, the firm has been able to produce boards with a density of 0.4 square inches per circuit in about six weeks, Van Regenmorter said.

Besides achieving a major time savings, Floating Point was able to make a return on its investment in about a year and a half, the company

said. Another benefit of computer-aided engineering is that designs are virtually error-free.

Additionally, the company no longer has the kind of coordination problems that it had in the past when working with service bureaus, particularly during modifications, the firm said.

## Guide targets graphics field

SUDBURY, Mass. — The third edition of *The S. Klein Directory of Computer Graphics Suppliers: Hardware, Software, Systems and Services*, containing 224 pages and more than 500 supply sources, is available now, according to the publisher, Stanley Klein of Technology & Business Communications, Inc.

The directory entries provide basic product information and business background on each company, including ownership, top management, company size, sales volume and year of origin, the publisher said. It also provides an address, phone number, Telex or TWX number and contact person, as well as a cross-index that identifies vendors by specific technology.

The new edition also contains a five-page briefing on the considerations and trade-offs to be made when buying computer graphics products.

The price of the directory is \$47 prior to June 20 and \$60 thereafter. The cost for overseas shipments is \$10 more. It can be ordered from Directory Manager, Computer Graphics Suppliers, 730 Boston Post Road, P.O. Box 89, Sudbury, Mass. 01776.

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## NEWS

# Interactive net boosts Pactel's DP, customer service

SAN FRANCISCO — A regional holding company said it has improved its business data processing operations and customer service with an interactive communications system that involves some 100,000 shared terminals and circuits for easier data base access.

The communications sys-

tem enables Pacific Telesis Group (Pactel) service representatives at terminals throughout California and Nevada to access multiple data base applications residing on more than 10 host computers located at four major data centers.

"We handle about 1.5 million messages a day," said

Kenneth Hughes, district staff manager of network system planning here. "Our service representatives can have the information to answer inquiries in about five seconds, even though they are accessing various computers."

Previously, Pactel's service terminals were dedicat-

ed to one circuit and one application or data base. Now, an individual terminal can access a number of computer systems; terminals on the same circuit can also access different systems.

In addition to speeding customer response, the communications system has enabled Pactel to utilize its

computer mainframes better through a constant flow of current on-line information and by offloading certain tasks to minicomputers. The communications network includes 18 Control Data Corp. Cyber 1000-2 processors, each of which includes multiple processors housed in separate bays that contain all the hardware elements of the system except the console, magnetic tape drives and interface adapter for the host computer. The multiple-processor arrangement allows for load sharing.

In case one processor is isolated off-line for a particular function, the adjacent unit can assume full responsibility. Transfer of a processor's load can be initiated by the operator or automatically triggered to handle any unscheduled interruption.

One hundred twenty-eight circuits can be linked to a single Cyber 1000-2 processor, with data transmission speeds of up to 9,600 bit/sec. The regional holding company currently operates the systems with links to about 10,000 terminals located throughout California and Nevada. The network is projected to grow to 16,000 terminals by the end of the year as more applications are added.

Pactel has utilized the communications system for applications in its operations support systems such as inventory control, service order retrieval and distribution and business office support systems.

## Provides directives

Software programs make the new data available in a variety of reports and integrate it with the proper data base. The system also provides directives for installation crews and other personnel responsible for completing a customer order.

Although the communications system was a major addition to Pactel's computer operations, it required minimal training for operators.

"We initially migrated to this architecture without having to invest significant dollars and training and with little trauma for operators," Hughes said.

The company began investigating improved network communications in 1976 when it became apparent that dedicated communications networks were becoming too expensive and difficult to manage.

"The present network architecture can be expanded to meet our needs through the 1980s," Hughes said. "With the network independent of host computers, we have flexibility that enables us to make modifications easily as conditions change."

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## NEWS

# Dasd management system reduces firm's storage needs

KANSAS CITY, Kan. — Montgomery Ward and Co.'s Data Center here, one of four across the country, discovered it could do without an additional mass storage system after obtaining a data set residency management system that automated the management and contents of its direct-access storage device (Dasd).

The center operates IBM 3033 and 370/168 systems, running under the MVS JES3 operating system. On-line storage is provided with 48 IBM 3350 Winchester drives and 12 IBM 3330 Model 11 rigid disk drives, which are hooked to a 3850 B2 mass storage system.

Before obtaining a new Dasd man-

agement system, center personnel "had to clear the pack on a data set level using the IBM utilities or dump the whole pack onto tape and restore [it] to another disk drive," according to Bob Dwyer, systems software specialist. "To do that, we needed a free pack to restore it. With DMS/OS, it is a much faster, much cleaner method, and I don't have to have a spare pack sitting out there just spinning and doing nothing."

About 1½ years ago, the center obtained Sterling Software Marketing's data set residency management system — DMS/OS — which, Dwyer said, has performed better than expected.

He first learned of DMS/OS at a Sterling Software seminar, and after he discussed the product with Montgomery Ward's corporate DP cadre, the company decided to evaluate the product. An IBM 3850 B2 mass storage system had been on order, but he subsequently recommended that the order be canceled, and the center has "gained back" two disk packs formerly committed to restoring.

"One of the most helpful capabilities of DMS/OS is that you can clear a pack quickly in a critical situation. When you have a pack out there that is taking some temporary hits, for example, permanent read errors, and you want to get off that spindle so

your customer engineer can work with it, it is just super to be able to hit the pack with the Vsam support, move the Vsam, hit the pack with the volume configurator, and move everything else to a string of packs," he continued.

"It's very quick. You don't have to sweat, and DMS/OS has taken care of the cataloging for you," he added.

## Regained space

Much of the regained space, according to Dwyer, was attributed to the Vsam support feature of DMS/OS: "The big thing is being able to move Vsam around and get rid of some of my suballocated space and create the data sets as unique. I then know exactly what I have out there so I don't have to come up arbitrarily with a figure on how much space I'm going to need in the suballocated space to put my data sets in. Now, I can treat it almost like a sequential data set, because I can look at my maps and see how much space a data set is taking up instead of going through the Idcams listing and looking at the relative byte address, which is really a very slow method of figuring out how much I am using.

"I can't say enough about DMS/OS' ability to move Vsam data sets... IBM's export method was very slow and was done cautiously," Dwyer said.

Dwyer was also pleased with the new System Productivity Facility (SPF)/Menu Selectable Unit of DMS/OS.

"I moved a lot of Vsam with the SPF option, which meant that I could sit right here in my chair and get the job done.

"Without SPF, it would be a little tougher because you are dealing with building control cards," he said. "DMS/OS' method of building control cards is simple, but the SPF option takes the guesswork out of it. You get the TSO/SPF panel screen, and it is very simple to tell DMS/OS what you want to do, which you can simulate or go in live mode. It gives you that option; otherwise, you have to bring up the JCL and build your control cards. Instead, DMS/OS asks you what you want to do. You can forget about that type of function because you have it on the screen."

## Initial shortcomings

Sterling Software addressed initial shortcomings through enhanced releases, adding multivolume Vsam with the latest version, Dwyer said. One remaining shortcoming, he said, is the need for "stand-alone restore so we don't have to maintain two sets" of backup.

Dwyer has an additional need — the support of multivolume sequential data — that probably will not be addressed, "probably rightly so," he said; the product will not restore to more than one device.

After attending a DMS/OS seminar, Dwyer discussed it during a field managers' meeting, which included managers from all of the Montgomery Ward data centers. He was assigned the task of benchmarking it here, and a copy was sent to the Chicago corporate site. As a result, Montgomery Ward purchased DMS/OS for three sites, with the justification it would eliminate the need for a 3085 B2 at each site.

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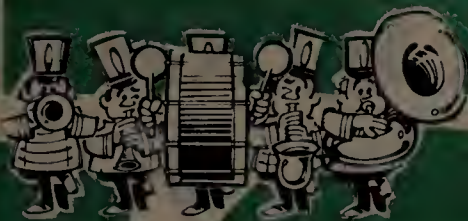
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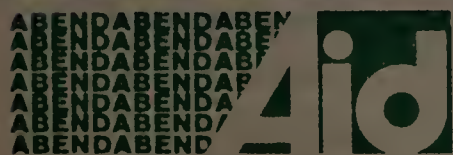
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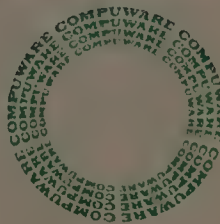
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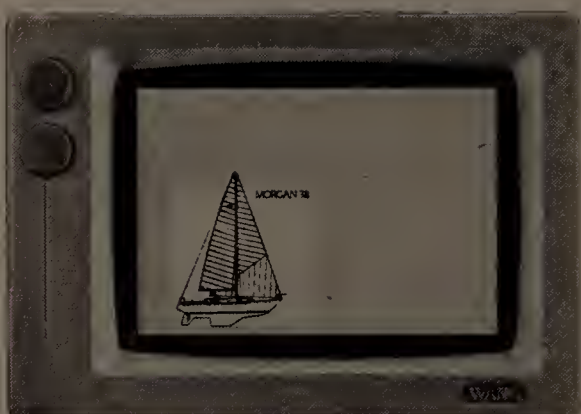
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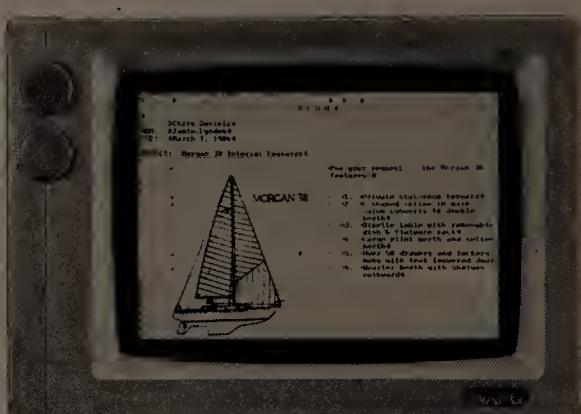
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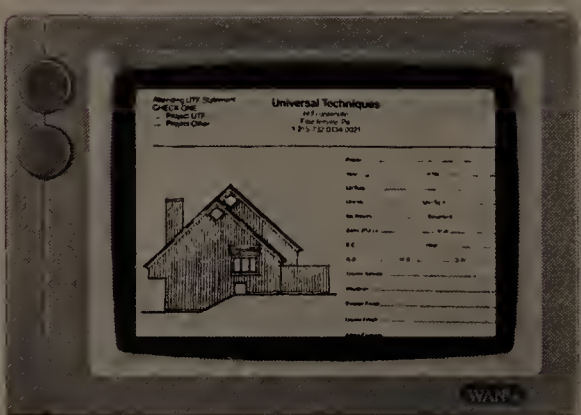
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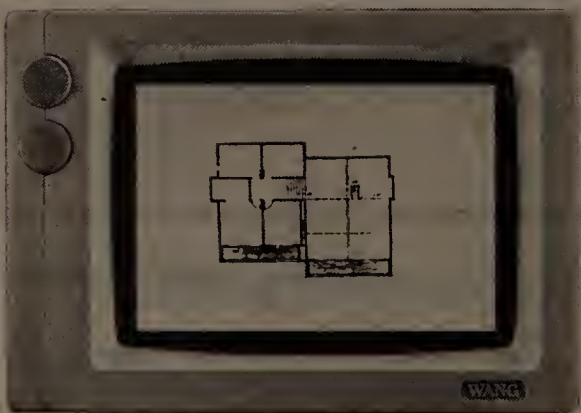
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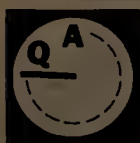
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## NEWS



## TURNAROUND TIME

Larry Long

**Q** I'm a DP manager in charge of all computer activity within my company. I was recently given the authority to hire two new programmers. My three systems programmers have been crying for more help and tell me that they need both slots. But as it is, my 28 programmer/analysts can't keep up with the backlog.

**Is our ratio of systems to applications programmers about right, or are we understaffed in systems programming?**

You need to light a fire under your applications group and hire a couple of systems programmers.

**Q** I am in the auto parts business. About three years ago, I considered purchasing a computer system for my business, but just could not justify spending so much money. So I bought a Radio Shack TRS-80 and several books, learned how to program and designed my own program.

As I was learning, I was also thinking of a program for my stores, one that would be unique. Until now, the only programs available for my business were inventory systems with accounts receivable, accounts payable and general ledger.

I developed a program to include cataloging (not available before), plus an accounting package, an inventory system and automatic purchasing. You would merely answer the questions that come up on the screen, and the system would give you the part numbers — no more catalogs.

I had little programming knowledge, so I found a programmer with a lot more knowledge. We made an agreement. I would pay him and, if it worked out, we would start a company and split the stock.

I was to put up the money and work, for I knew the automotive business.

Since the project cost more than anticipated, my partner gave me 7% of his stock, and I put in additional funds. I now hold 57%, and he holds 43% of the stock.

When the program was about three-fourths complete, we unveiled our product at an automotive show in January 1983. The program was the talk of the industry. We were approached by a competitive computer company that wanted an exclusive to our program and data base.

Unbeknownst to me, while I was negotiating with this company on behalf of our company, my partner was also talking with them.

The end result was that my partner removed all the equipment from our office, including the source program, data base and all working terminals.

A week later I got a call from this competitive company telling me that they took a stock option on my partner's shares and gave him some kind of work option. They sent me a copy of a proxy to vote, but refused to give me a copy of the contract that includes the work option. They insist that they have no trade secrets. After this, my partner returned the equipment.

This company still wants to make a deal. They want to purchase my shares, but at nowhere near the price of the exclusive deal we were negotiating before all this occurred.

After over two years of hard work, I am frustrated that a large corporation can come in and just take over.

Is there any advice that you could give me, especially regarding the laws and ethics in the computer field?

The laws protecting proprietary software provide some guidance for resolving legal disputes for common situations, but yours is not a common situation.

However, the scope of your dilemma is surprisingly typical of cases that will be peppering our judicial

system in the near future.

If your description of the course of events is accurate, I would have to assess your partner's actions as unethical. But illegal? That's another question.

Your partner could say that he was operating on the behalf of your company and, of course, he has the right to sell his stock in the company.

As for your desire to see the work option contract of your partner, I am not optimistic about a competitive company volunteering such information.

You may, however, be able to get it through the courts.

Your auto parts software has a fair market price that is probably somewhere in between the starting point for your initial negotiations and the company's most recent offer.

As I see it, the final gun hasn't sounded. You still have some negotiating power.

A large software company will not market your product or anything similar, given the circumstances described in your letter. To do so would leave them vulnerable to unfavorable litigation against them.

I'm hopeful that this unfortunate sequence of events can be resolved to the mutual benefit of you and the competing software company.

*Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, P.O. Box 880, Framingham, Mass. 01701.*

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# Term-Tronics Creates With the Power to

In the beginning the Computer Universe was a lonely place. There was IBM and only IBM. Then others entered the field, major competitors such as DEC. Today, each of these Computer Age Titans commands an impressive following.

But because no one has a monopoly on desirability, there arose a knowledgeable user population which sought the best of both worlds. To serve this astute and growing audience, Term-Tronics was born.

## **Multi-Host Capability — a Stroke of Genius!**

Utilizing breakthrough technology, Term-Tronics created MEGA II, the first truly generic terminal. With a single keystroke, the unit can emulate IBM or DEC.

MEGA II is coaxial plug-compatible to IBM 3278\* and 3178\* and plugs directly into IBM's 3274\* controller. So there's no longer a need to be concerned with protocol incompatibilities. That adds up to the kind of peace of mind that has customers walking on clouds.

What's more, MEGA II can be used in either local or remote environments with SNA or BSC communications.

Incredibly, MEGA II emulates IBM 3278 Models 2 through 5 with a single keystroke. The multi-host MEGA II is DEC VT-100\* compatible. It also can emulate other asynchronous terminals simply by loading new emulations into the terminal via telephone, and all in 10 minutes or less! Another heavenly advantage is that it requires no additional equipment.

## **Putting the Finishing Touches on the Masterpiece**

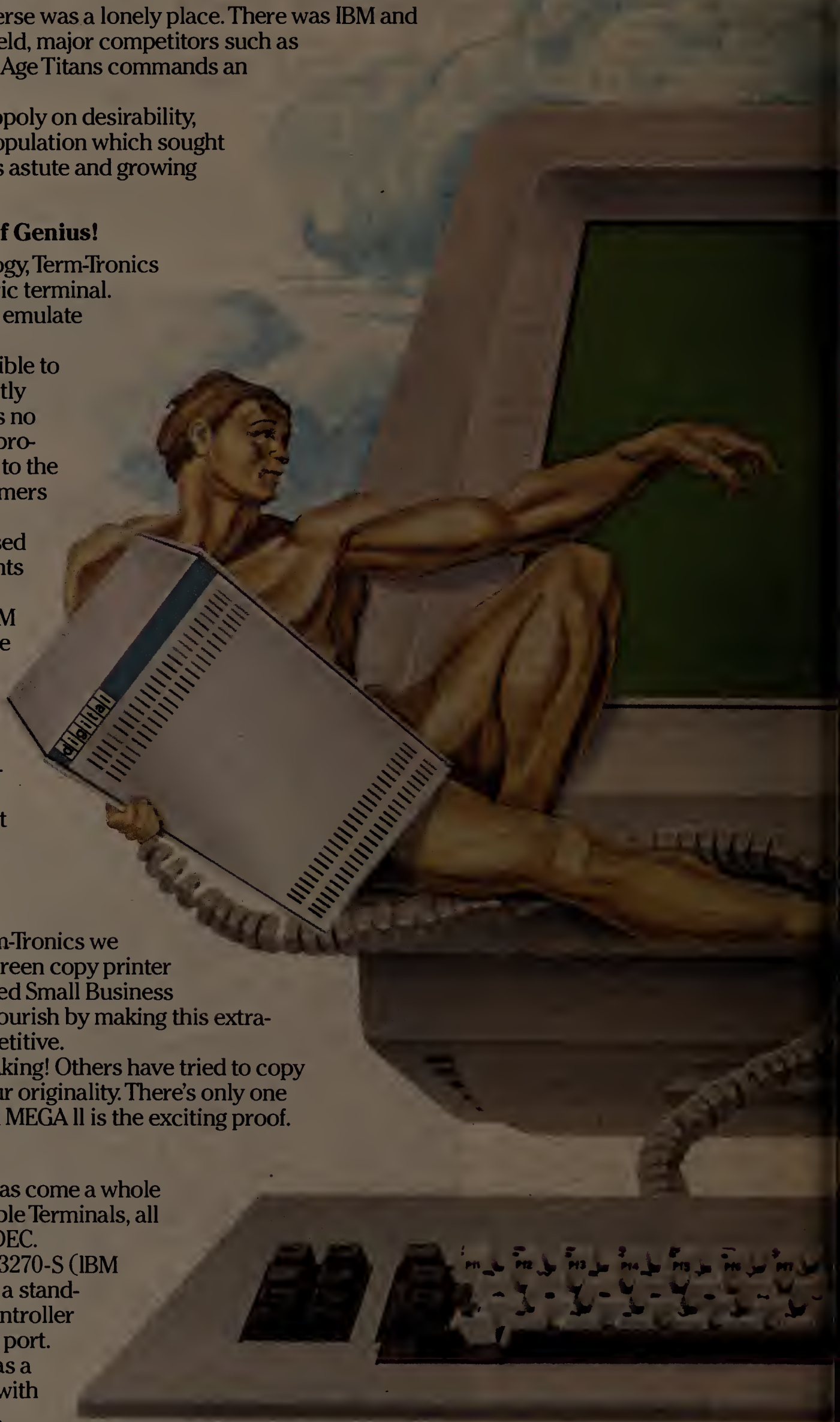
But we didn't stop there. At Term-Tronics we went on to add support for a local screen copy printer and an RS232C port for a CP/M® based Small Business Computer. Then we finished with a flourish by making this extraordinary unit remarkably cost competitive.

The results have been earth-shaking! Others have tried to copy our achievements but they lacked our originality. There's only one Master of Data Communications and MEGA II is the exciting proof.

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From the same creative minds has come a whole series of remote BSC mode Compatible Terminals, all of which can be upgraded to talk to DEC.

These include the Term-Tronics 3270-S (IBM 3275\* or 3276\* compatible) which is a stand-alone terminal featuring a built-in controller and a separately addressable printer port. The 3270-6 (IBM 3276) which also has a built-in controller and can interface with 3 additional terminals and 4 printers.



# Term-Tronics



# a Multi-Host Terminal Join IBM and DEC.



The 3270-4 (IBM 3274, Model 51C) a controller with 12 ports allowing for any combination of terminals and printers. The 3270-8 (IBM 3278 Model 2) plugs into Term-Tronics' 3270-4 or 3270-6 controller.

Plus there's the 3270-9 (IBM 3279-2A\*), a 4 color terminal which plugs into the Term-Tronics 3270-4 controller or the 3270-6 terminal. Also the 3270-9 comes as a 4 color standalone model with built-in controller.

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## NEWS

## Computer literature guide out

PHOENIX — The "1983 Cumulation of the Computer Literature Index," a 330-page guide to computer industry literature published during 1983, has been published by Applied Computer Research, Inc. (ACR).

The guide covers nearly 200 periodicals and a variety of data-processing-related books and conference reports, according to an ACR spokesman. Each entry in the publication is annotated to provide a concise statement of the content of each article, paper and book.

The guide is said to be a comprehensive, subject-indexed guide to topics in electronic data processing administration, computer systems applications, communications, the computer industry, technology, personnel and training, equipment selection, software and programming, systems analysis and DP techniques.

The publication features more than 360 subject classifications and a complete author index.

The "1983 Cumulation of the Computer Literature Index" is available for \$35 from ACR through P.O. Box 9280, Phoenix, Ariz. 85068.

## International storage meet set in Denver

DENVER — Datastorage84, an international forum on issues and areas of change in the data storage industry, is scheduled for Sept. 17-19 at the Fairmont Hotel here.

The third annual forum sponsored by California publishing and consulting firms Disk/Trend, Inc. and Freeman Associates, Datastorage84 is expected to focus on issues influencing planning and strategy decisions by manufacturers and buyers of disk and tape storage products.

Topics include rigid disk interfaces, diversity among 100M- to 300M-byte magnetic disks, optical disks, transition in recording heads, the next step in rigid disk media and higher capacity floppy disks.

The conference fee is \$850. Additional information is available from the forum manager, Cartlidge & Associates, Inc., located at 4030 Moorpark Ave., San Jose, Calif. 95117.

## Directory of top computer execs available

PHOENIX — Applied Computer Research, Inc. (ACR) has published the spring 1984 edition of its "Directory of Top Computer Executives," which contains information on over 8,900 data processing executives.

According to ACR, the directory serves as a Who's Who of DP management at

more than 7,950 computer sites in the U.S. The publication is organized in a geographic format, with an industry cross-reference guide.

Each entry in the guide contains the company name and address, type of industry, telephone number, computer systems installed and names of the top DP execs.

Industry and government classifications include manufacturing, banking, diversified finance, insurance, retail, transportation, utilities, education, health services and federal, state and local government.

The directory covers firms with gross annual sales of at least \$50 million or annual

DP budgets of more than \$250,000.

Published in the spring and fall of each year, the "Directory of Top Computer Executives" is priced at \$125 per copy or \$200 for an annual subscription.

ACR can be reached through P.O. Box 9280, Phoenix, Ariz. 85068.

COMPUTERSERVICESREPORT  
January 1, 1984  
**Comshare lands a sweet one.**

The Detroit News  
Jan 4, 1984  
**A calculated decision**

Business Day  
The New York Times  
Wednesday, January 4, 1984  
**Comshare, I.B.M.**

THE ANN ARBOR NEWS  
Tuesday, January 3, 1984  
**Comshare signs agreement with IBM**

News release  
**COMSHARE**  
IBM AND COMSHARE SIGN  
COMPLEMENTARY MARKETING AGREEMENT  
ANN ARBOR, Mich.--The IBM Corporation and Comshare, Incorporated have completed an agreement identifying Comshare as a Complementary Marketing Organization. Comshare field representatives will assist IBM in situations where a 4300 system can be justified by a System W decision. The broad data processing knowledge and products from IBM and the specialized decision support software and skills of Comshare complement each other for business problem solving. In a Computerworld editorial published January 16, 1984, the expected result of the IBM/Comshare agreement was stated as follows: "...it is safe to say that users will be the big winners in this latest IBM marketing foray." Decision support software is in popular demand in medium and large companies across all industries. The primary market for System W is where an Information Center is being employed or where a company desires productivity software satisfying the information, modeling, analysis and reporting needs of business planners and managers.

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Columbus Citizen-Journal  
Jan 7, 1984  
**Comshare, IBM sign pact.**

COMPUTERWORLD  
EDITORIAL  
JANUARY 16, 1984  
**Interesting deal**

Electronic News  
JANUARY 9, 1984  
**Comshare, IBM Plan 'Complementary' Mktg.**

The Phoenix Gazette  
Jan 10, 1984  
**IBM, Comshare complete deal**

MISWeek  
Wednesday, January 11, 1984  
**IBM, Comshare Sign 'System W' Sales Pact**

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## NEWS

# Company solves capacity problems with disk system

CHESWICK, Pa. — When a promotion management firm learned that its business and on-line transaction traffic were doubling, the company faced the problem of increasing its disk capacity when it had no room for expansion in the computer room.

That was the problem that Action Industries, Inc., head-

quartered here, had to cope with in its rapid-growth second quarter of 1983.

The company, which provides special sales advertising and merchandise to retail chains, solved the storage problem with the help of a Storage Technology Corp. (STC) 8650 double-density disk system that provided

5½ times its previous capacity and with an STC Sybercache controller to minimize head contention.

Four years ago, Action Industries was a \$47 million company, but by the spring of 1983, it was running at a projected annualized rate of \$100 million, a peak that it has maintained since.

Recalling 1983, Bobbie Carter, Action Industries' information systems vice-president, said, "When we plugged in the proposed business volumes, we found two things were going to happen to us, in addition to people problems. First, our on-line system was going to slow to a crawl.

"Second, the on-line systems come down at seven at night, and we go into production. We try to have all the paperwork cleared up by the time people come to work in the morning. And there's no way you can do twice as much work in the same amount of time."

The firm was particularly concerned about the on-line operation because the business is conducted almost entirely on-line.

At the time, Action Industries used 14 Memorex Corp. 3640 and 3644 disk drives, IBM 3340-type disk drives, with its two 3M-byte Magnuson Computer Systems, Inc. M80 mainframes. The firm lacked the storage capacity to handle the growth and lacked the space in the data center to add more 3640s and 3644s, products with which Action Industries said it had no problem other than the capacity.

## Leased STC 8650

After reviewing proposals by several manufacturers, Action Industries decided to lease the STC 8650 with five 1.2G-byte boxes, which saved 40% of the floor space used by the previous drives, Carter said. But even with the amount of information that the system would allow Action Industries to store, there was still the head contention problem involved with running 10 to 14 jobs at a time.

"Moving the head is the slowest process we have," Carter said. That was why the company added the Sybercache 8890 dual controller, which at the time was installed in only one or two IBM DOS field locations.

Sybercache uses cache buffering with intelligence to preread entire tracks rather than move around heads. The process reduces head movement while moving mass data at channel speed, according to Carter. It also is designed to be tunable, keeping statistics of what it reads and writes, which then helps the user decide what to keep in cache.

Originally, 14 350M-byte volumes of data were placed under Sybercache control, which provided an average read-hit percentage of 66%. The company then shifted three low-activity, low read-to-write ratio volumes to dumb control. That shift helped to raise the read-hit percentage to 72% at night and 67% during the day.

Action Industries' order file now carries more than one million items, compared to 600,000 before the conversion, while the number of transactions, the volume of business and the on-line activity have all doubled since the beginning of 1983.

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```
W File: STRATEGY MODEL   A Specify Model(Variable) Rule Option:
                               Variable   1 of   3
==>
Variable ==>
Description:-->
Rule:-->           1 Line
-----
Variable ==>
Description:-->
Rule:-->           1 Line
-----
Variable ==>
Description:-->
Rule:-->           0 Lines
-----
```

PF keys: Help=1 Extra=2 Zoom out=3 Toggle=4 Top =5 Up =7 Compress= 9  
Bottom=6 Down=8 Expand =10





## NEWS

# Laser printers speed Oregon's document turnaround

## Processing time for Legislature's documents cut by more than 25%

SALEM, Ore. — Five distributed laser beam electronic printers in the Oregon State Capitol building are speeding the turnaround of key legislative documents by more than 25%, freeing couriers to perform other duties.

According to Dale Claudel, director of Oregon Legislative Information Systems (Olis), four electronic printers were installed in October 1982, two each in the administrative work areas of the state Senate and House of

Representatives. The printers enable legislators to receive documents several hours sooner and much more quietly than previously possible.

After a brief assessment of available IBM printers, including daisywheel and ink-jet types, Claudel decided on laser technology. Noting that not many laser printers were being manufactured in 1982, Olis chose Xerox Corp.'s 2700 distributed electronic printer, "the only one we found that met the requirements for throughput, quality and size," Claudel said.

The 2700s were priced competitively at approximately \$18,000 each, Claudel said. The machine takes up five square feet of space and is said to be as quiet as a photocopy machine — noise be-

ing an important consideration in the Capitol. "All you can hear is the paper movement," Claudel said.

Printing 90,000 dot/sq in. (300 by 300 pixels), the 2700 can generate a complete image, including text, lines, logos and signatures, on standard 8½-by 11-in. paper at a rate of up to 12 page/min.

Since the Oregon Legislature meets only six months every two years, Claudel said it is important to produce draft bills quickly to give legislators working copies. The Capitol staff has been able to cut back on couriers as well because the Xerox printers are strategically located where they are most needed.

### Automated publishing

Olis was created in 1974 to automate the publishing ac-

tivities of the Oregon Legislature. With 21 employees, the department provides support for the legislative committees and councils of both Houses. Olis also maintains the text of the Oregon statutes on-line and employs a key-word retrieval system to provide the state's 30 senators and 60 representatives with printouts of requested statutes.

The Xerox 2700 printers are used to print not only legislative drafts, but also the final copy of the revenue and fiscal impact notices associated with each measure. Other documents produced on the 2700s include interoffice memos, the output of Olis' key-word document retrieval system, minutes of committee meetings and hearing transcripts.

Besides its distributed Xerox 2700s, Olis has two noisier IBM 6670 electronic printers located in remote areas in the Capitol building — two floors and a lengthy corridor away from the legislature's work areas. The 6670s are primarily for high-volume printing of bills and final amendments. A number of daisywheel printers are dispersed throughout the work areas, including nine Telex Computer Products, Inc. 286Bs and five IBM 7436s, all of which are connected to IBM 3274 cluster control

units.

Using IBM Binary Synchronous Communications protocols, the Xerox and IBM printers and the 3274 control units are linked via Penril Corp. shorthaul modems and leased telephone lines to a 16M-byte IBM 3081 computer, four blocks away in the state Department of Revenue building.

The 3081, which runs IBM's JES2 under MVS, drives the printers with IBM's Advanced Text Management system word processing software under CICS. The 3081 employs IBM's Storage and Information Retrieval system software to support Olis' text retrieval services.

After the Xerox printers were brought on in 1982, a few minor problems occurred, Claudel said. The most serious problem was that whenever paper jammed, it would heat up and become charred, frightening operators. Xerox serviced the machine so that the heater device shut off when jamming occurred. Things have run smoothly since, Claudel said.

As for the future, Claudel plans to use the Xerox 2700 printers to record all actions taken on a measure. Thus, the chronology of a bill or amendment could easily be produced in hard copy.

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# David

## Recommends Texas Instruments

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## NEWS

# Firm calls on micros to manage meeting center projects

NEW YORK — Citicorp's new conference facility, Arrowwood of Westchester, is a prototype for conference centers built specifically for executive tastes and life-styles. It is one of five properties managed by Conference Environments Corp. (CEC), which plans, markets and manages executive conference centers and hotels throughout the U.S.

Effective management of CEC's properties, according to Thomas G. Huffsmith, director of information services for CEC, requires gathering and processing timely information from all of CEC's operating units. "We are now fine-tuning our methods of retrieving managerial information," Huffsmith said. "It is unthinkable to do this manually. And doing it through the mainframe at \$104 per hour for programming people is not cost-justifiable."

CEC, which has headquarters here and in Boston, as well as five regional offices, also needs to provide immediate revenue and expense projections for developers coming to CEC with new projects. The information gathered during on-site investigations must be transmitted to the main offices for analysis before the financial projections can be made.

Huffsmith, already familiar with the versatility and flexibility of personal computers, was convinced they were the appropriate tools to solve CEC's problems. "We looked at minis, but decided that personal computers were better suited to our needs. Their spreadsheet capabilities make them very adaptable for cash flow and feasibility studies and projections. And we can even put a personal computer in our car if we need it at another location."

Huffsmith researched available systems at a computer store in Boston. He walked away with a Wang Laboratories, Inc. Professional Computer.

A major factor in the decision for Huffsmith was that the Wang micro is menu-driven. "This cuts down on learning time enormously," he commented. "The menus are on-line, which makes it easy to understand how a program works. There is no need to memorize commands, and the Help key is invaluable. . . . Communications are particularly easy since the menu can be manipulated and modified."

"I also like the Wang personal computer's design," he added. "You don't have to deal with the CPU sitting on top of the desk, with the screen on top of it. You can move the screen around for comfort, and the keyboard, with its templates that show you what each function key does, is really helpful."

Although CEC purchased its first two Wang Professional Computers for home office use, the company recognized their capabilities for the operating properties as well. "We are upgrading faster than we ever thought we would," Huffsmith said. "Projects are being automated that were never before considered because of the cost and lack of flexibility of some of the mainframes."

At least 10 Professional Computers are now on-line, with more to come. Sales and marketing, forecasts and budget control are the three main categories of applications that run on the micros.

Sales and marketing, perhaps the most critical function in hotel management, has benefited greatly from automation. A report program called Smart, developed and copyrighted by CEC, collects statistics on elements such as market segmentation, geographic origin and type of program. It serves as a source-of-business report that enables CEC to target advertising and sales efforts more precisely and cost-effectively. This program was previously run by a time-sharing company five to 10 days after the end of the month. Today, it is available on a daily basis, enabling CEC's sales director to respond dynamically to market changes.

Before the micros were installed, financial projections for new projects or existing properties were produced manually. These reports project revenues and expenses on a five-year basis. Using a spreadsheet program, they can now be completed, including graphs, in one-fifth the time previously required. The time it typically takes to incorporate last-minute changes into the reports is down from three hours to about 15 minutes.

From entries of manually generated payroll figures and mainframe data, the micros produce daily departmental profit-and-loss statements. See CEC page 52



CEC's Tom Huffsmith (standing), and Arrowwood's Michael Sieverts.

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## NEWS

# Time division makes timely, cost-saving micro buy

NEW YORK — Time, Inc.'s Corporate Manufacturing and Distribution (CM&D) Division spends almost half a billion dollars a year to print and distribute millions of copies of *Time*, *People*, *Sports Illustrated*, *Life*, *Discover*, *Fortune* and *Money*.

The introduction of microcomputers at CM&D over the past year had as dramatic an effect as the legendary cry, "Stop the presses!" in a busy printing plant.

Prior to 1983, CM&D's use of computers was limited primarily to the large-scale, transaction-oriented systems necessary to process bills, calculate inventory levels and produce subscriber mailing labels. But user

satisfaction was low despite substantial annual information systems expenditures.

In early 1983, a newly created CM&D Information Services unit developed a divisional information systems plan.

A proposal to purchase and install a dozen IBM Personal Computers was a key component of the divisional plan for future information systems operations.

The microcomputers would provide CM&D with interactive computing capabilities and, consequently, allow CM&D to reduce its reliance on costly time-sharing services. At minimal cost and with low risk, CM&D

would also have the opportunity to experiment with a new technology.

During the past year, microcomputers have proliferated within CM&D. Forty-five IBM Personal Computers are now installed in staff offices and remote plant locations. These include 10 sites in the U.S. and five sites overseas. All costs will be fully recovered by June of this year as a result of reductions in time-sharing usage.

Applications at Time's CM&D unit include analyses of subscriber delivery patterns, compilation of data on ink usage, periodic comparative analyses of key vendors, support for contract negotiations, tracking of docu-

ments related to pending postal regulations, forecasting of paper requirements, word processing, budgeting and estimating, electronic mail and accessing mainframe-based accounting packages.

Virtually all applications rely on purchased, off-the-shelf software packages. After working with Micropro International Corp.'s Wordstar for word processing, CM&D recently made a switch to Softword Systems, Inc.'s Multimate.

Lotus Development Corp.'s 1-2-3 offers electronic spreadsheet, file management and business graphics capabilities. Presentation-quality graphics are supported through Graphic Communications, Inc.'s Graphwriter package.

## E-Mail network

An international electronic mail network with significant cost advantages over telex or facsimile transmission has been implemented using Microstuf, Inc.'s Crosstalk XVI software, GTE Telenet Communications Corp.'s Telemail service and Hayes Microcomputer Products, Inc.'s Smartmodem 1200s.

Microcomputer users access IBM mainframes in New Jersey and Chicago corporate data centers through CXI, Inc.'s Pcox board. The Pcox board allows a Personal Computer to emulate an IBM 3278 CRT terminal and permits the transfer of data files between mainframes and microcomputers.

The availability of relatively inexpensive and easy-to-use hardware and software has been crucial to the success of this effort. However, the real key was training and support, spokesmen for Time said. For every \$6 spent on hardware, \$1 has been spent on training.

Two vendors — the Personal Computer Learning Center and Computer Knowledge — supply hands-on laboratory training. Individuals from Time, after returning to the office from half-day, off-site classes, are assisted when necessary by members of CM&D's Information Services unit.

The implementation effort is far from complete. Additional expertise needs to be developed in the use of electronic mail. Uncertainty regarding future directions in local-area networks has prevented an investment in this technology despite the need to connect computers, printers, modems and plotters. Several project management packages have been tried, but none seems to satisfy all needs completely. A powerful yet easy-to-learn data base management package has yet to be found, the spokesmen said.

## New interest

The new microcomputers within CM&D have created an interest in computing.

A monthly newsletter detailing new developments in the information industry, distributed to all division staff, has a readership throughout the corporation.

A periodic luncheon seminar series called "Bits & Bytes" has an average attendance in excess of 40 people. CM&D staff members now talk about "putting this on a personal computer" in much the same tone that they used to describe making a telephone call.

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## NEWS

# ISDN meet set for June 12

McLEAN, Va. — A conference on "Digital Bypass Strategies — The Closing ISDN Opportunity Window" will be held here June 12-13 at the Sheraton National Hotel.

Sponsored by Telestrategies, Inc., the conference will feature seminars on topics such as "Digital Services via Cable TV," "Strategies for Mobile Data Communications," "The Future of Centrex vs. The Digital Switch Market" and "Local, Regional and Wide-Area Corporate Network Interconnection."

An exhibit will feature private branch exchanges, software, data and word processing equipment, voice store-and-forward systems and

fiber optics. A special one-day pre-conference seminar titled "Digital Network Technologies, Economics and User Strategies" will be held June 11. Registration for the one-day seminar is \$495; the two-day conference registration fee is \$795; registration for all three days is \$1,095.

Additional information is available from Telestrategies through P.O. Box 1218, McLean, Va. 22101.

## CEC from page 50

ments. Instead of having to wait 15 days after the end of the month, CEC is now able to compare actual results to the budget instantly.

Inventory tracking is also performed through the personal computers. A china, glass and silver inventory system has cut the time required for monthly inventory control from 1½ days to three hours. A recipe analysis program permits cost control and revenue tracking on a day-of-the-week and seasonal basis.

Commenting on staff reaction to the personal computers, Michael Sieverts, data services manager of Arrowwood of Westchester, said, "Some of the staff members were what I would call 'compuphobic,' or gun-shy. But when they saw what the system could do and how easy it was to learn, thanks to the on-line menus, they embraced the technology. How can you argue with a piece of equipment that cuts down the time needed for a task by 80%? Now, people are clamoring for time on the personal computer."

Kay DeLoach, a CEC corporate regional controller, is responsible for developing a chart of accounts for all of CEC's hotel properties, which involves descriptions of some 250 accounts. "By using the Wang Professional Computer's word processing capabilities, I can revise and edit the chart, keeping it constantly updated," she said. "Weeks of my time are saved."

# Getting timely information to 50,000 people who need it is an event in itself.



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## NEWS

# Lobbyist group matches its growth with DP purchases

WASHINGTON, D.C. — The National Tax Limitation Committee (NTLC) was spawned in the same time period, 1975, as the microcomputer industry.

Currently lobbying for an amendment to the Constitution that would require a balanced federal budget, the committee purchased its first microcomputer, a North Star

Computers, Inc. Horizon, in 1977 to manage its data base and produce mass mailings.

As the NTLC grew, so did its computing needs. "We are now working with our third generation of hardware and software," said Jim Tyson, NTLC computer operations manager.

This third generation includes Teletex Enterprises,

Inc.'s master and slave CPU boards with Zilog, Inc. Z80 microprocessors; Konan Corp. SMC-100 disk controller; Control Data Corp. Mini Module Drive; Phoenix System, Inc. hard disk drives; and Musys Corp. Turbodos software, which supports a network of microcomputers using Digital Research, Inc.'s CP/M operating system.

Four Digital Equipment Corp. VT100 terminals, two Radio Shack TRS-80 Model II microcomputers and a Kaypro Corp. Kaypro IV microcomputer access the system.

The second-generation system included an Infsoft Systems, Inc. I/OS operating system.

"The operating system was limited and riddled with bugs," said Tyson. "We needed better vendor support and additional capabilities, such as electronic mail, so we switched to Turbodos. Since both systems supported the CP/M operating system, conversion was easy and we

could use our existing software."

Turbodos, a multiuser, multitasking operating system offers features such as multiple-level directories, print spooling, record locking and shared peripheral capabilities.

Other software that NTLC uses includes Micropro International Corp.'s Wordstar, Mail/Merge and Supersort and Ashton-Tate's Dbase II.

The system helps the committee generate an average of 100,000 letters each month. Some letters containing information concerning federal spending are mailed to congressional members and voters.

Since NTLC is a nonprofit organization, other letters are mailed to prospective donors. The committee has 600,000 individual members and a number of corporate members.

The huge volume of mail requires large system peripherals.

"We have customized these packages to take advantage of laser printers," Tyson said. "We have a few letter-quality printers, but we use laser printers to produce the bulk mailings." NTLC's printers include an IBM 6670 laser printer, which produces up to 1,500 pages per hour, a Xerox Corp. 2700 laser printer that prints 720 copies per hour and a Centronics Data Computer Corp. 6600 band printer.

The committee plans to continue expanding its system. "Our data base software is written in Dbase II, but we've outgrown that package's capabilities and are looking for a replacement," Tyson said. "We need a package that will allow fast, multiuser access to large data base files under Turbodos. Hopefully we could upgrade the package to a Unix or Pick & Associates, Inc. Pick operating system in the future," he said.

## Software guidelines out

WASHINGTON, D.C. — The Institute for Computer Sciences and Technology with the U.S. Department of Commerce has announced that a new publication for validating, verifying and testing computer software is now available, called "Federal Information Processing Standards Publication 101."

The guideline presents an integrated approach that reportedly should be used throughout the software life cycle. Also included is a glossary of technical terms and supporting publications. The publication is intended for use by software developers, managers, verifiers, maintainers and end users.

The price of the publication is \$8.50. It can be ordered from the National Technical Information Service, 5285 Port Royal Road, U.S. Department of Commerce, Springfield, Va. 22161. The ordering code is FIPSPUB101.

## China to host exhibition

HONG KONG — Computer China '84, an international computer exhibition, has been set for Nov. 25-Dec. 1 in the People's Republic of China Xiaman Special Economic Zone.

Organized by the China Microcomputer Applications Association and Adsale Exhibition Services, it is intended to introduce micro and minicomputer technology to Chinese end users, specialists and import officials. The exhibition will feature Chinese manufacturers of computer products, who the organizers reported are ready to discuss joint ventures and coproductions with their foreign counterparts.

Details are available from Adsale Exhibition Services, 21st Floor, Tung Wai Commercial Building, 109-111 Gloucester Road, Wanchai, Hong Kong.

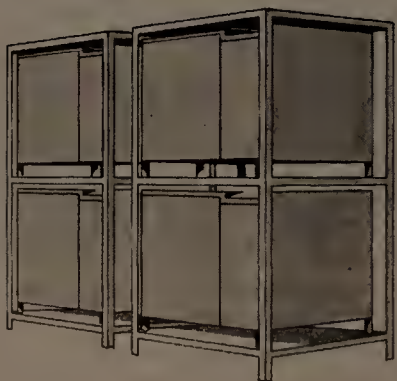
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## NEWS

# Communications firm automates accounts receivable

## Collectors handle heavier work load; customers' delinquency rates cut in half

DALLAS — It tripled its customer base in just three years, but U.S. Telephone, Inc. found that its manual customer accounts collection process could not handle the work load.

"We have cycle billings, 20 cycles a month, and sometimes we didn't get an updated trial balance for six weeks," Chuck Giles, U.S. Telephone's vice-president of credit management, recalled. "We could ask a customer for payment, but we couldn't tell him the dollar amount of his most recent invoice."

U.S. Telephone was dissatisfied with its high delinquency rate of 75 to 80 days on the average for 10,000 customers. Even the best collectors managed just 1,800 accounts, with the average carrying 700. U.S. Telephone wanted to raise that average to 3,500.

"Our collectors posted cash and credits manually, then made telephone calls for collections. We were lucky to get a complete trial balance and an updated record every four weeks," Giles said.

Collectors spent 2½ hours each day posting cash and credits in the 75% manual system. Invoices dating back more than a year filled a 10-ft square room.

### Doubled accounts handled

In 1982, the telecommunications firm installed an IBM 4300 processor with a new accounts receivable package and more than doubled the number of accounts that each collector handled, exceeding even its own goals.

The software it chose was the Accounts Receivable System from Management Science America, Inc. (MSA).

MSA recommended that the new system parallel the old, but U.S. Telephone decided against that because confidence was low in the old system. U.S. Telephone ran its data through a conversion program to convert it to MSA transactions. The data reportedly balanced to the penny on the first try.

### Only 18 hours' notice

Before U.S. Telephone installed the 4300, it ran the MSA system on a service bureau's IBM system for nine months. When the time for conversion to the in-house system arrived, U.S. Telephone had only 18 hours' notice before the 4300 was up and running.

"We had just done a dry run of moving the system, knowing the move was impending. We brought CICS down at 3:30 [p.m.] and ran the last batch cycle so everything would be balanced," Lee Daly, director of customer information systems, said. Workers spent the night unloading files, bringing in the input tapes and rebuilding the libraries.

"I think it's significant that we basically copied the disk packs from a multiframe, large service bureau environment with limited programmer support," Daly said. "We brought the system up with no modifications at all. We were up on CICS on the IBM 4300 the next morning with virtually no downtime."

Daly reported that an average of 25 collectors and cash appliers use the accounts receivable package on a

daily basis.

They use the system to run three times a month and send out 8,000 to 10,000 letters each billing cycle.

"Today, most of our people are managing 4,000 accounts. Some have been managing more than 6,500," Daly noted.

"Our days' sales outstanding [figure] has been reduced significantly. We've met our goals," he said.

Delinquency is down from 33% to 16%, he added. The changeover has also allowed the company to improve its method of handling disputed bills. "Being a telephone company," Daly

said, "we get calls now and then about bills. You know, 'I didn't make this call to Fargo, N.D.' So we recently installed a change in the system that allows us to dispute one item rather than an entire invoice. If the invoice is for \$1,000 and the item in question is for \$50, the customer can pay the \$950. In the aging codes, \$50 remains as the disputed amount. This reflects the state of our receivables more accurately."

Giles noted that since that \$50 disputed item is set aside, the collectors can treat it as a promise to pay and not constantly review it. "They are

only working with broken promises to pay, which saves a lot of time — particularly since they had been looking at all the accounts to determine who paid under the old system," Giles said.

Giles described U.S. Telephone's new accounts receivable package as "essentially paperless," with the collectors completely on-line, reading everything they need on terminal screens.

U.S. Telephone, which Daly said paid \$75,000 for its system, has since shifted its customer information and billing to a similar IBM system.



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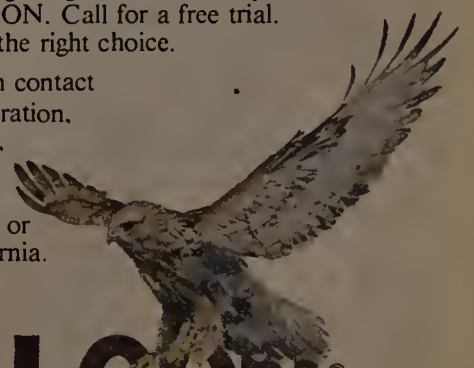
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## NEWS

# Army command enlists micros to meet OA onslaught

WARREN, Mich. — A U.S. Army command here is deploying stand-alone microcomputers to prepare for the major changes that office automation will cause when it is implemented in the near future.

The main element in this strategy is software packages that run under both Digital Research, Inc.'s CP/M and Unix operating systems.

At the U.S. Army Tank Automotive Command (Tacom), data on the testing of Army vehicles has been stored on computers since the early 1970s. This data is used for reliability and related calculations and for monitoring the scheduling of all tests on Tacom vehicles.

Datapoint Corp. 1500 microcomputers are used to enter data to disk and to emulate Control Data Corp. terminals.

The data is then transmitted to data bases on CDC Cyber 74-28, 825 and 6600 mainframes. In August 1982, one of the Datapoint 1500s was upgraded to a 1550, and CP/M 2.2 was ordered.

The Reliability, Availability and Maintainability Data Branch of Tacom then selected and ordered several software packages during the last quarter of 1982.

## Army plans OA

During this time, the Army was also implementing a plan to introduce office automation technology in its various commands, including the Data Branch. Completed in mid-1983, a study on facilitating the OA implementation recommended a network of supermicrocomputers that utilize the Unix III operating system, although it did not specify any particular ones.

Meanwhile, independent of the CP/M acquisitions and the OA studies, the Data Branch created a study group to consider how to improve test data collection systems. Several independent systems that used different DP equipment had been developed in different locations and in different Army organizations.

As the potential of OA for improving these test data collection systems became evident, a plan to integrate OA into the test data collection systems was developed. Part of the plan called for using packaged software running under CP/M on the Datapoint equipment to prototype various subcomponents of the proposed integrated test data collection system.

Further consideration within the Data Branch resulted in the decision to develop a strategy using CP/M-compatible programs to prepare for the use of the recommended OA equipment

and programs.

The CP/M-compatible packages were selected for their adequacy for intended uses, availability under both CP/M and Unix and ease of use by nonprogrammers.

As a result of the selection process, Microsoft, Inc.'s Multiplan was chosen for spreadsheets and Condor

Computer Corp.'s relational data base management system (Series 20) was chosen for procedures that require a data base management system.

The utilization of software packages that run under both operating systems will allow data bases and files created under CP/M to be available

without a major conversion effort when Unix equipment and software are installed. Personnel trained to use a particular software package will not require additional training to work productively.

Selection of the initial procedures to be automated also had to be considered in prepa-

ration for OA. Relatively simple procedures that can be easily handled by the applications programs were selected for the first-time computer users.

As users' experience with the application program grows, the complexity of the assignments will increase.

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## NEWS

# Sporting goods store tackles inventory with System/34

UTICA, N.Y. — A sporting goods dealer here was being blitzed by inventory control problems until he signed up an electronic quarterback.

Klein's All-Sports, a six-store retail chain in central New York state, stocks and sells some 80,000 different items, from sports equipment to uniforms and trophies. For

example, company owner Don Klein said, the store stocks some 400 different styles of shoes, some of which may come in up to 20 different sizes and four colors.

Keeping track of all that merchandise by a manual method was becoming an unmanageable task, so the com-

pany decided to see if a computer could bring some order to the inventory process. According to general manager Alan Brill, the company first experimented with several microcomputer-based systems, but they proved unsatisfactory because of problems with incompatibility and maintenance. Brill

couldn't recall what products comprised those systems, but he described them as a hodgepodge of hardware and software from different vendors.

The company finally decided last November to purchase an IBM System/34 small business computer. The system includes a 128M-byte

hard disk drive and has 128K bytes of memory. Other components are IBM 5255 and 5211 line printers, as well as seven IBM 5251 display stations. In addition, the store adapted a software package developed by a women's retail clothing store for use with the system.

"Our IBM System/34 computer helped us tie what had been a huge and confusing jumble of loose ends into a very manageable and business-like package," Klein said, pointing to softballs as one example. "Before the computer, we had to guess how many softballs to order for team, league and individual unit sales each year. Invariably, we either didn't order enough and had to buy more in mid-season at premium prices, or we bought too many, and had to absorb the cost of stocking the extras all winter."

"Now," he said, "we know exactly how many softballs were sold in each area last year, and we can make an intelligent purchasing decision based on that knowledge."

The company also uses the system for tracking sales employees' productivity.

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## Forum set for Toronto

TORONTO — Futurist Alvin Toffler and former U.S. Secretary of State Dr. Henry Kissinger will be among the more than 20 speakers featured at the Software Panorama-84 exhibition.

The conference will be held at the Royal York Hotel here May 23-25.

Sponsored by the Data Processing Management Association of Canada, the conference is targeted to data processing managers, operations managers, network systems planners and analysts, programming managers and corporate financial officers.

Conference speakers will focus on the selection and integration of new technologies, new management techniques for the computer age and changes in manpower requirements due to the "electronified economy," the sponsors said.

The conference will also feature a variety of vendors exhibiting software products and related services, according to the sponsor.

The cost to attend the full Software Panorama-84 conference is \$525.

Further information is available through Communications Kraft, Inc., Suite 200, 200 Consumers Road, Willowdale, Ont. M2J 4R4, Canada.



## NEWS

# System eases inventory maintenance for shipyard

## Credited with lower tool-purchasing costs and increased worker productivity

SEATTLE — A smooth, efficient flow of tools to the right people at the right time is crucial to any successful manufacturing or maintenance organization. When a large number of workers and workstations are involved, a computer not only expedites tool transfers, but allows managers to monitor the tool inventory. It also enables a company to save money on tool purchases, and it helps increase work force productivity.

In addition to monitoring tool inventory, calibration dates for calibrated test equipment must be maintained and reported, ensuring that

maintenance is performed on schedule. Information about employee safety equipment, such as safety glasses and respirators, respirator training and efficiency, should also be maintained.

While such a system would seem quite straightforward and easy to implement, requirements for speed and accuracy present major obstacles to classic keyboard entry. To overcome these problems, Data Enterprises of the Northwest, Inc., developed a bar-coded Automated Tool Inventory Control and Tracking System (Aticts) for Todd Pacific Shipyards here.

Originally, Todd had used a manual system to track the more than 15,000 types of tools required by skilled workers in the yard. As the work force grew, there were considerable delays in issuing tools and long waiting lines at each toolroom, especially during shift changes. Proper maintenance of tools was difficult with no central control, and workers were encountering frequent outages and poorly maintained tools.

With the manual system, the craftsman first would give the tool keeper an embossed badge. This was placed in a charge-a-plate-type ma-

chine with a 3½- by 8-in. card. The tool keeper would emboss the card, handwrite a description of the tool or its serial number and sign the card. The tool would be given to the craftsman, and he would also sign the card. The tool keeper then would manually file the card by employee name within the department. This procedure took an average of 40 seconds for each tool issue.

When the tool was returned, the check-in process took an average of 60 seconds. The employee would present the tool and his badge, the tool keeper would look up the issue card (this consumed most of the time), tear the card in half, give back the employee his badge and put the tool away in the proper bin.

This slow and cumbersome system, with no central control, was creating morale problems, causing shortages and increasing tool costs. Todd management decided to install a computer system to achieve the following objectives:

- Enhance productivity by supporting the tool department with fast check-out and check-in of tools.
- Improve the ability to provide employees with the proper tools at the proper time near the work site.
- Provide management with a timely tool management decision support system.
- Do all this while concurrently maintaining complete tool inventory and tracking capabilities.

### Tool control systems

To support these objectives, Todd looked at various tool control systems in other shipyards and manufacturing companies. Many of these existing systems offered much of what Todd was looking for. The systems, which utilized on-line workstations, accomplished data input by way of key entry. This method caused some concern because it was no faster than the embossed card equipment system. In addition, there were bound to be information errors made as tool keepers entered data by way of a keyboard.

During the study, it was suggested that Todd check out tools the way food is now being checked out at grocery stores, with the use of bar codes. Todd decided to use bar-code technology in the system for check-in and check-out, using Code 39 symbology.

The system was designed, written and installed on a Prime Computer, Inc. Model 450-II minicomputer, running the Primos operating system, with 1M byte of main memory and 250M bytes of disk storage located in the main toolroom. The local network has 27 on-line workstations. Each

See **TOOL** page 62

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## NEWS



Tool bins with associated bar codes at Todd Pacific Shipyards.

**TOOL** from page 60

workstation is configured with an on-line CRT terminal and at least one industrialized bar code reader.

All tools are categorized as unique (one of a kind); unique calibrated (requiring specific recalibration dates); nonunique (many copies of the same thing, such as wrenches); and consumables (items used up, such as ear plugs and sanding disks). There are several million items in this inventory. All are now associated with a bar code. The calibrated and unique tools are individually assigned a bar code; the others, a code and quantity.

With this system, the tool keeper no longer has to fumble with a card filing system. Instead, he passes the bar code scanner over the employee's encoded badge and job number and

the tool bin.

Check-out and check-in of tools average around three to 10 seconds while recording employee ID, tool ID, quantity, toolroom ID, time, date and job.

The system allows tool keepers to search for a tool by asking the computer where it is. This feature also helps direct employees to the nearest toolroom containing the needed tool. Tools can be checked in at any toolroom.

Locker assignment and control (the responsibility of the tool department) is also monitored by the computer.

Portable toolrooms near work sites enable employees to obtain tools quickly. Prior to installing Aticts, the estimated average time needed for an employee to round up the proper tool was 30 minutes, if everything went well. That was the time it took to climb out of a ship, walk to the nearest toolroom, check out a tool, walk back to the ship and climb back down to the workstation. Frequently, though, an employee would have to go to several toolrooms to find the tool needed.

Now, portable toolrooms are placed on the deck of a ship by a crane. The computer terminal is patched into the communications network through a telephone jack on the pier, on-line with the telephone system. The portable toolroom is then patched on-line to the computer. The tool keeper can use the phone and the terminal simultaneously. This makes it possible to keep the satellite toolroom properly stocked at all times. An employee need only go to the ship's main deck, get the tool needed and go back to the workstation. Estimates are that this takes, at the most, 10 to 15 minutes.

Employee morale, both in the tool department and at the work sites, has been improved by Aticts. The tool keepers are able to respond faster to the craftsmen's needs. Now that employees can get the right tools when needed and near the work sites, their enthusiasm is higher, and their attitudes are more positive.

**Problems caught earlier**

Computer-generated reports alert tool department management to problems in time to provide a solution before it is too late or more costly. The system provides information covering order points, maintenance schedules, misuse of tools, overissue to employees, tools not returned, unusual breakage and wear-out and history of losses. The system also maintains a history by employee of lost, worn or broken tools.

Tool purchasing information provides the tool department foreman with information on cost, discounts, delivery history and so forth.

The combination of these benefits has assisted in the accomplishment of the main objective of the system — to provide greater productivity through better tool management.

As a result of the benefits derived from the use of Aticts, the users are enjoying a substantial increase in production hours at no additional labor cost.

Using bar-code-driven Aticts, Todd has cut its tool replacement cost by over 30%. The company expects to pay for Aticts in less than a year from the date it was implemented. The dollar savings anticipated were estimated at more than \$600,000 per year.

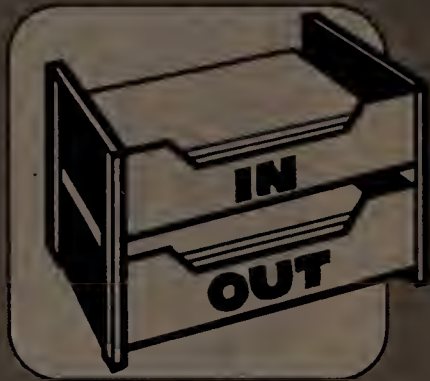
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## NEWS

# System lets high-tech firm keep pace with rapid growth

STOUGHTON, Mass. — Vanzetti Systems, Inc., a Mass.-based high-technology firm, last fall shipped its first \$200,000 laser inspector to Texas Instruments, Inc., where it is used to identify and repair solder defects in printed-circuit boards. The shipment represented years of product development for the growing firm, and the investment is already paying dividends — Vanzetti's sales went from \$1.7 million in 1982 to \$2.6 million last year.

The company added 15 employees in 1983 and now has a payroll of 75. As much as these numbers indicate a positive future for the company, they foreshadow a problem common to rapidly expanding firms: Could Vanzetti control this growth?

The 15-year-old firm, located here in a 25,000-sq-ft plant, anticipated this need well in advance, and early in 1983, Vanzetti hired a financial analyst to choose a computerized control system for both production and accounting requirements.

The manual reporting procedures then in use were slowing down manufacture and sale of the company's industrial temperature control devices, as well as its Laser/Inspect product, a combined laser and infrared detector that eliminates visual inspection of printed-circuit boards. Vanzetti incorporates state-of-the-art infrared radiation, fiber-optic and laser technologies to manufacture these electronic controls, which cost from \$3,000 to over \$200,000.

## Increase efficiency

Michael Dostoomian joined Vanzetti a year ago as financial analyst and systems manager with specific instructions to select a computer system that would increase the efficiency of the company's manufacturing and financial reporting operations.

After a selection process that began last fall with 14 firms, Vanzetti selected the FM/3000 productivity system developed by Computer Solutions, Inc. of Burlington, Mass.

The financial, manufacturing and inventory control system combines Hewlett-Packard Co. HP 3000 minicomputers with Computer Solutions-developed productivity software.

Vanzetti expects complete pay back of the \$110,000 system in less than three years. "Previously, we were facing an eventual increase in our staff of at least four people at an annual cost of \$60,000," he said. Dostoomian estimates that within a year, two employees would have been added to the ac-

counting department, another salesman and another person for inventory control.

He decided the best approach to automating Vanzetti's production and accounting procedures was to coordinate a number of the company's operations. He reviewed each department's needs, developed a request

for proposal addressing those needs and then held a tour for vendors.

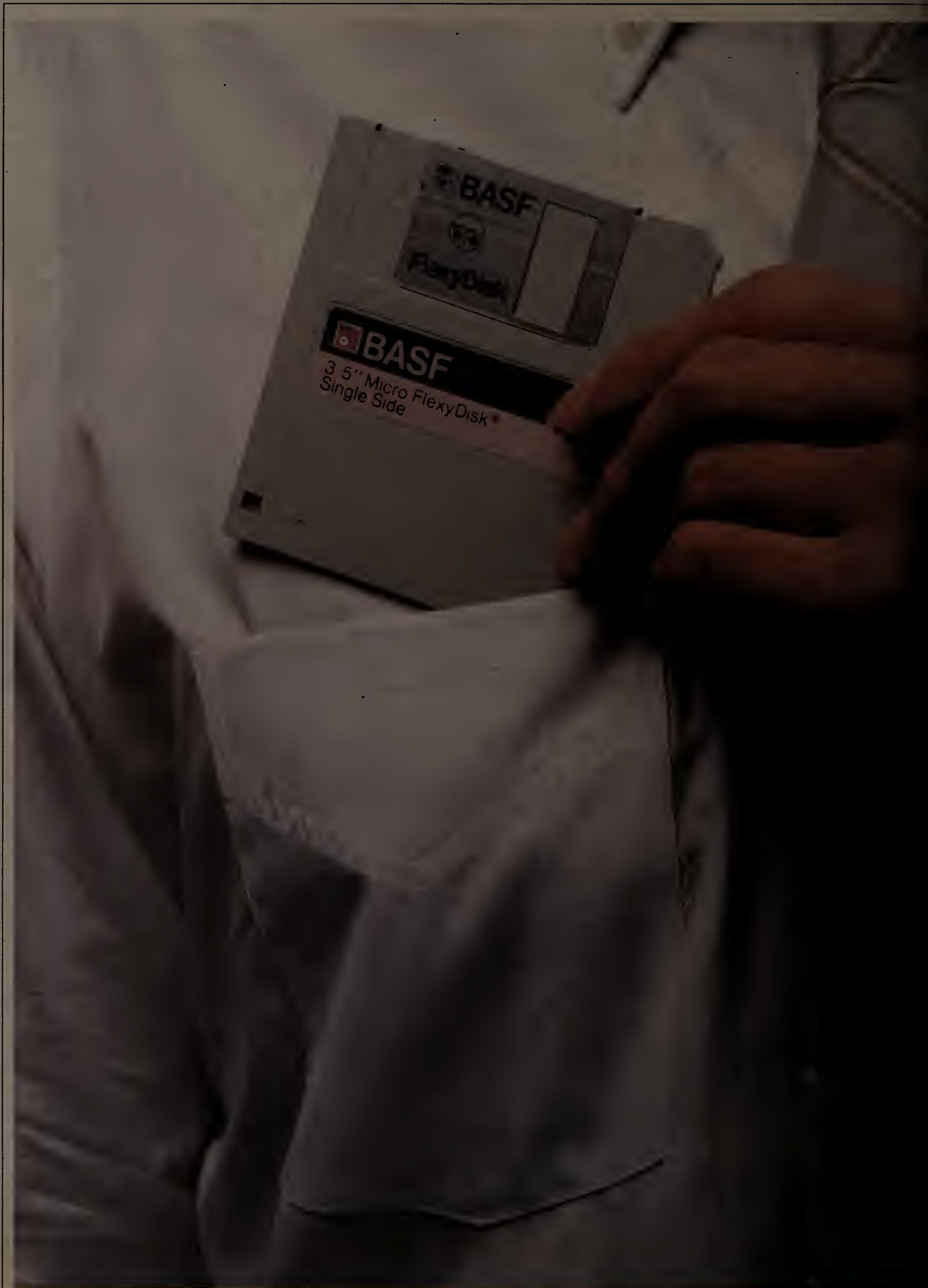
Vendors submitted responses to a series of yes or no questions from each department as to whether a particular service could be provided. After reviewing the 14 proposals with various department heads, they

narrowed down the list of vendors to three finalists. Before making a final decision, Vanzetti officials visited sites where the three systems were in use.

The software programs of FM/3000 are menu-driven and include financial and manufacturing functions, such as general ledger, ac-

counts payable, accounts receivable, materials requirements planning and inventory control.

Noting the company's expansion of on-hand and on-order inventory, Dostoomian said control of parts inventory for the company's products is critical to on-time client delivery.





## NEWS

# Firm meets worldwide mart demands with MRP system

Lets filter manufacturer measure performance, maintain reduced inventory

COOKEVILLE, Tenn. — When its Cookeville plant opened in 1968, Fleetguard, Inc. was in an enviable position. It had a captive market, supplying oil, lubrication and water filters for heavy-duty diesel engines manufactured by its parent corporation,

Cummins Engine Co.

Using this solid base, Fleetguard developed a marketing strategy to penetrate the heavy-duty diesel market, both OEM and for on- and off-highway vehicles. This strategy was designed to carve out a specific market

niche to avoid head-on competition in the light-duty automobile filtration commodity market.

This approach paid off. Between 1971 and 1978, total sales tripled, making Fleetguard one of the largest manufacturers of heavy-

duty wet filters in North America. Fleetguard also became a worldwide distributor, opening facilities in Australia and Europe.

Meeting the demands of a worldwide market required Fleetguard to expand its initial offering of a few prod-

ucts to well over a thousand. It also required adding manufacturing capacity.

But as the company moved in this direction, problems began to develop. Fleetguard had to upgrade its batch manufacturing control system, continually adding more and more patches to handle the additional demands.

"We reached a point where we had a Band-Aid system, and it was no longer effective. It couldn't grow with us and with our business strategy," said Jim Morton, plant manager.

Fleetguard made schedule changes and developed production reports daily. It also printed pick lists once a week to check material availability. But Fleetguard ended up trying to run the shop floor with information that, in many cases, was at least a week old.

The net result was that the shop floor was basically run from expedite lists to support daily schedules.

## Batch system unsatisfactory

The company also used a batch system weekly to measure its plant performance. However, the weekly information did not satisfy management, causing manufacturing to produce daily reports manually. When the two reports were compared at the end of the week, they rarely agreed.

After a study of current problems and future needs, Fleetguard concluded it required an on-line manufacturing control system.

After reviewing proposals from three computer vendors, Fleetguard chose Sperry Corp., installing a Sperry 1100 mainframe, the Sperry Unis manufacturing control system and the Sperry Query Language Processor (QLP 1100).

"Our previous system consisted of a number of stand-alone systems. We wanted to tie them all together into one data base, integrate the functional areas and concentrate on running the shop floor more efficiently," Morton said.

The on-line Unis system enabled Fleetguard to address those goals.

Material availability is now checked on-line, and shop paperwork is released to the shop floor usually a day or more before production time. Schedule changes are now handled in the scheduling area rather than on the shop floor.

Improved control of the shop floor was a primary objective in acquiring the on-line Unis system. But determining product costs and measuring manufacturing

See MRP page 66

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## NEWS

**MRP** from page 65

performance were also areas of concern. Before, Fleetguard was able to estimate the costs of manufacturing a product — but only as long as it ran on its normal, or prime, production line.

If demand required manufacturing the same product on an alternate route, or nonprime production line, the company had no way of knowing the exact costs.

"We had no way of rolling up costs, since the old system couldn't handle alternate processing and alternate material," said Jim Dunn, lead systems analyst. "There was no way of knowing how many people and how much raw material actually went into making a product."

**Crucial information**

Having this information became crucial. "There was no way we were going to survive if we kept up our 20%-a-year growth rate," Dunn said.

"With the Unis system, we can now look at production units with clean-cut data and measure the performance of each line," Morton said.

This knowledge enables the company to determine whether it is more profitable to switch production to a nonprime line or to stretch delivery dates according to capacity on the prime line.

Similarly, shop floor managers can find out almost immediately how production is progressing. If snags such as equipment breakdowns develop, adjustments can be made more quickly to keep production up.

**Daily reports**

The on-line system also produces daily reports of exactly what the shop is doing.

"With the old system, we could only get weekly reports. Now, you don't need to make adjustments once a week to get on target for the month. You can do it daily," said Doug England, manager of manufacturing.

As Fleetguard began making improvements on the shop floor, the company underwent a significant change in its philosophy of controlling inventory. Fleetguard decided to follow Japanese methods by working with as little raw material inventory as possible.

When Fleetguard started using the Unis system, it was debating whether to build an automated storage and retrieval system warehouse area at a cost of \$10 million to \$11 million. This facility would accommodate raw and in-process inventory estimated to last for 40 days.

Instead, Fleetguard used the Unis system to help reduce inventory. It is now down to a 19-day supply of raw and in-process inventory, and the company is aiming for a 10-day supply. Instead of adding more warehouse space to accommodate a large inventory, Fleetguard now has empty storage bins in its existing warehouse.

"The Unis system has enabled us to reduce our security blanket of unneeded inventory," England said.

Part of the reason for the reduced inventory is that raw material can be received, verified and put into the manufacturing process faster.

"When we received raw material in the past, we had to wait until the batch reports were processed. That was usually the next day. Now, with the on-line Unis system, the receipt transaction is entered into the sys-

tem at the dock, and the information is then immediately available to the production schedulers," England said.

"We would have tried to reduce inventory, anyway, because of the current downturn in the economy," Morton said. "But the system has definitely been the tool that allowed us to make the reductions. And we accomplished this while maintaining our service levels to customers and our manufacturing efficiency."

**'Just-in-time' philosophy**

In the future, Fleetguard plans to follow the just-in-time philosophy of manufacturing, further reducing its raw material and in-process inventory.

For Fleetguard's purchasing department, the system has greatly re-

duced the time necessary to process a purchase order, has increased data accuracy and has allowed reductions in personnel.

"We had five people handling purchasing before. Now we have four, and they are probably doing it a lot better," said Barbara Williams, inventory control manager and work-in-process coordinator.

"The system has helped improve efficiency in the purchasing department by automatically generating purchase orders for review after each material requirements planning (MRP) cycle," according to Frank Wassell, purchasing manager.

"This has reduced our lead time and increased the accuracy of purchasing data. By using data in the data base, we don't have to reenter all the information manually on each

order. The purchase order is printed automatically, reviewed and mailed," he said.

"Before, we had material coordinators review the MRP planners and prepare purchase order request forms. Secretaries then typed the orders and sent a copy to data entry. Finally, orders would be processed."

Another advantage of the on-line system is that the data processing department is no longer responsible for data entry. Each user department, such as purchasing and engineering, now enters its own data.

"We had two major problems with data entry in the batch mode. We had a high turnover of keypunch operators, and there were delays in correcting data when errors occurred," said Vernon Wilson, supervisor of plant systems.



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## NEWS

# Minicomputer link gives service bureau printer new life

## Controllers help out-of-production printers retain speed

WEST HAZLETON, Pa. — A service bureau that wanted to retain the speed and dependability of its out-of-production IBM printers found controllers that let it use those printers with Hewlett-Packard Co. HP 3000 Series 44 minicomputers.

When Leader Data Processing (LDP) got rid of its seven-year-old IBM 360 batch system in favor of an on-line HP system three years ago, the company decided to keep its two IBM 1403-N1 high-speed impact printers. "Besides saving the cost of replacements, we needed to keep the print quality and dependability of

the 1403-N1," said George Schneider, LDP's vice-president for technical services. "For example, for one client we print 120,000 prenumbered checks each month. We wanted to retain the speed and dependability of the IBM 1403-N1 when printing this and other applications."

Schneider said that checks and specialty forms, such as account statements and billings, are a good portion of LDP's business and that the 1403-N1, out of production for more than a decade and only available now on a reconditioned basis, remains particularly well-suited for

such jobs. "That printer had been abandoned a long time before, but it was still doing a good job," Schneider said.

When converting to the four-processor HP system, LDP bought two Spur Products Corp. S-1403 controllers, which are designed to let 1403 printers operate with non-IBM systems. The controllers, each linked to two HP computers, can be switched to print on either computer by remote Spur SRS-1 switches on the operator's console.

"One computer in each pair can be driving the printer while the other is

being set up," Schneider explained. The SRS-1 switch is designed to prevent a computer from transmitting data if an operator inadvertently switches to a printer that is not ready for operation.

The controllers include a high-speed paper-advance feature intended to increase throughput of the 1,100 line/min printers. The Spur controller advances up to 256 lines directly to the next line to be printed, without stopping at lines that the printer is to skip.

Since installing the controllers, LDP has added an HP 2680 laser printer to its system, operating independent of the IBM 1403-N1s and removing some of the work load from the IBM printers. The laser printer is used to produce reports and other stock 11- by 14-in. paper printing.

In addition to supplying the controllers, Spur took over maintenance of LDP's printers. Spur markets the controllers, priced at \$18,000, and the rebuilt printers, priced at \$6,000.

## Participants for March meet sought by ACR

PHOENIX — Applied Computer Research, Inc. (ACR) is seeking speakers, panelists and chairmen to participate in its sixth Conference on Electronic Data Processing Performance Management, scheduled for next March 11-14.

ACR is particularly interested in presentations describing user experiences and case studies. A spokesman for ACR said no formal papers will be required, although participants will be requested to supply copies of handouts and visual aids.

The performance management conference is primarily oriented toward management issues, the spokesman added. Topics for the 1985 conference will include the relationship of capacity planning to business planning, capacity management, cost accounting and chargeback, communicating with management, performance of distributed systems, forecasting user work loads, information centers, performance considerations in design and quality assurance.

The deadline for submissions is July 1. Participants will be given a 50% discount on the conference registration fee.

More information can be obtained from ACR through P.O. Box 9280, Phoenix, Ariz. 85068.

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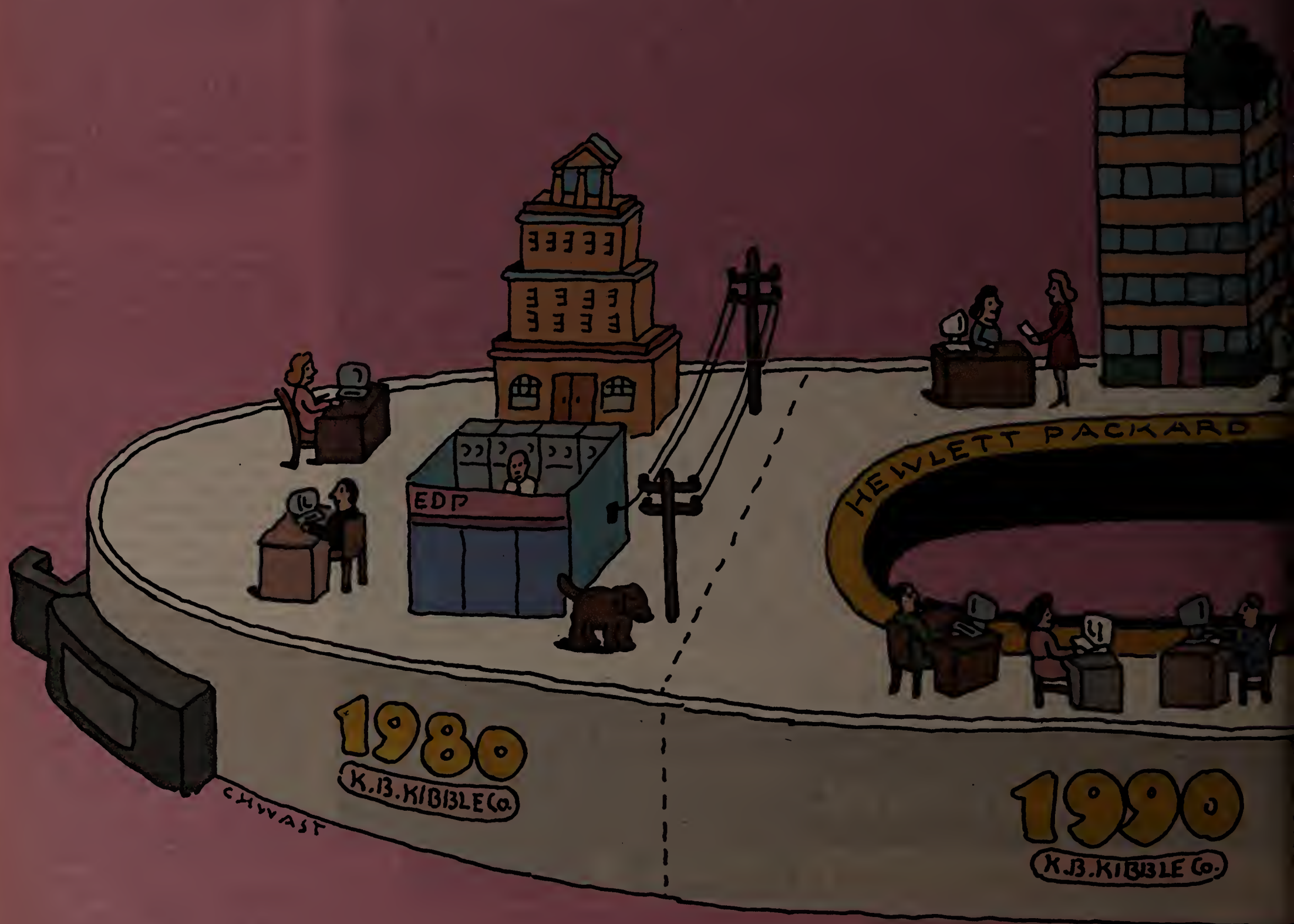
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## NEWS



## CALENDAR

## WEEK OF JUNE 3

**JUNE 8-10, MONTREUX, SWITZERLAND — CAM-I International Spring Seminar: Computer Integrated Manufacture.** Contact: Rhonda Gerganess, CAM-I, Inc., Conference Services, Suite 1107, 611 Ryan Plaza Drive, Arlington, Texas 76011.

## WEEK OF JUNE 10

**JUNE 12, NEW YORK — Introduction to Knowledgeman.** Contact: Center for Advanced Data Processing, Inc., Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

**JUNE 12-13, NEW YORK — Spreadsheet Using Lotus 1-2-3.** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

**JUNE 12-14, BOSTON — DP Quality Assurance.** Contact: QED Information Sciences, Inc., QED Plaza, P.O. Box 181, Wellesley, Mass. 02181.

**JUNE 12-14, CHICAGO — Advanced Manufacturing Systems Exposition & Conference 1984 (AMS '84).** Contact: AMS '84, 708 Third Ave., New York, N.Y. 10017.

**JUNE 12-14, BOSTON — Introduction to Telecommunications.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

**JUNE 12-14, MINNEAPOLIS — CICS/VS Internals for Systems Programmers.** Contact: Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

**JUNE 12-15, CHERRY HILL, N.J. — Microprocessor Software, Hardware & Interfacing.** Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45404, 6305 Arizona Place, Los Angeles, Calif. 90045.

**JUNE 12-15, LOS ANGELES — Hands-On Microprocessor Troubleshooting.** Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45404, 6305 Arizona Place, Los Angeles, Calif. 90045.

**JUNE 12-15, BOSTON — Data Communications.** Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45404, 6305 Arizona Place, Los Angeles, Calif. 90045.

**JUNE 13, NEW YORK — Advanced Dbase II.** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

**JUNE 13, NEW YORK — The Metropolitan Area IBM 8100 Users Group.** Contact: Jo Ann Klein, Consolidated Edison Co. of New York, Inc., 4 Irving Place, New York, N.Y. 10003.

**JUNE 13-14, WASHINGTON, D.C. — Advanced Topics of ADP Project Management.** Contact: U.S. Professional Institute, ADP Project Management, Department AB, 1620 Elton Road, Silver Spring, Md. 20903.

**JUNE 13-14, SAN FRANCISCO — How to Prepare a Strategic Plan for Office Automation.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

**JUNE 13-15, WASHINGTON, D.C. — Introduction to Network Architectures.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

**JUNE 13-15, CHICAGO — PC World Exposition.** Contact: PC World Exposition, Mitch Hall Associates, P.O. Box 860, Westwood, Mass. 02090.

**JUNE 13-15, DAYTON, OHIO — The Sixth Annual National Educational Computing Conference 1984.** Contact: Lawrence A. Jehn, Computer Science Department, University of Dayton, Dayton, Ohio 45469.

**JUNE 14, NEW YORK — Advanced Lotus 1-2-3.** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

**JUNE 14-15, BOSTON — Evaluation & Selection of Security Software.** Contact: Marge Cohen, MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

**JUNE 14-15, ORLANDO, FLA. —**

**IDMS System Generation & Tuning.** Contact: Harris Education Center, 1025 W. Nasa Blvd., Melbourne, Fla. 32919.

**JUNE 14-15, MONTE CARLO, MONACO — Electronic Printers.** Contact: Gail van Tubergen, Dataquest, Inc., 1290 Ridder Park Drive, San Jose, Calif. 95131.

**JUNE 14-15, NEW YORK — Datacom Network Design & Planning.** Contact: Probe Research, Inc., P.O. Box 590, Morristown, N.J. 07940.

**JUNE 14-17, LOS ANGELES — Byte Computer Show.** Contact: The Interface Group, Inc., 300 First Ave., Needham, Mass. 02194.

**JUNE 14-18, TOKYO — World Computing Services Industry Fair.** Contact: The World Computing Services Industry Fair, International Congress Service, Inc., 2-7-4, Nihon-

bashi, Chuo-ju, Tokyo 103, Japan.

**JUNE 15, NEW YORK — Advanced PC-DOS 2.0.** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

**JUNE 15, NEW YORK — PC/IX (IBM's Unix).** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

**JUNE 16-17, NEW YORK — CICS Command-Level Intensive.** Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016. Also being held June 23-24 in New York.

## WEEK OF JUNE 17

**JUNE 17-20, BOWLING GREEN, KY. — The 17th Annual Conference**





## NEWS

of the Association for Small Computer Users in Education. Contact: Dr. Dudley Bryant, Western Kentucky University, Bowling Green, Ky. 42101.

JUNE 17-21, SNOWMASS VILLAGE, COLO. — **The Annual Conference of the Government Management Information Sciences.** Contact: J.M. Lewis, Data Services Division, City and County of Denver, 3840-L York St., Denver, Colo. 80205.

JUNE 17-21, TEL AVIV — **Bank Transfers via Computer Networks.** Contact: Nancy Italia, Italia & Co., UMB/PSI Conference, Suite 350, 2700 Cumberland Pkwy., Atlanta, Ga. 30339.

JUNE 18, NEW YORK — **Introduction to the IBM Personal Computer.** Contact: Center for Advanced Data Processing, Inc., Suite 402, 450

Seventh Ave., New York, N.Y. 10123.

JUNE 18, NEW YORK — **Word Processing with Multimate.** Contact: Center for Advanced Data Processing, Inc., Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

JUNE 18, DENVER — **Dbase II.** Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

JUNE 18-19, BOSTON — **Dbase II.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held June 20-21 in Burlington, Vt., June 25-26 in Pittsburgh and June 27-28 in Cleveland.

JUNE 18-19, ORLANDO, FLA. — **CICS Transaction Design.** Contact: Harris Education Center, 1025 W. Nasa Blvd., Melbourne, Fla. 32919.

JUNE 18-19, SAN FRANCISCO

— **Micro/Personal Computer Operating Systems (Unix, Xenix, MS-DOS, CP/M)** Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

JUNE 18-19, FAIRFIELD, N.J. — **Lotus 1-2-3.** Contact: The Personal Computer Management Association, 11928 N. Earlham, Orange, Calif. 92669. Also being held June 21-22 in Anaheim, Calif., and June 25-26 in Cincinnati.

JUNE 18-19, DALLAS — **Principles of ADP Project Management.** Contact: U.S. Professional Development Institute, ADP Project Management, Department AB, 1620 Elton Road, Silver Spring, Md. 20903.

JUNE 18-20, WASHINGTON, D.C. — **Data Dictionaries: Concepts, Contents and Uses.** Contact: Barnett Data Systems, 19 Orchard

Way N., Rockville, Md. 20854.

JUNE 18-20, OAK BROOK, ILL. — **Personal Computers in the Gas Industry Environment.** Contact: Marianne MacDonald, Institute of Gas Technology, 3424 S. State St., Chicago, Ill. 60616.

JUNE 18-20, SAN MATEO, CALIF. — **X.25 and Packet-Switching Networks.** Contact: Systems Technology Forum, Inc., 9000 Fern Park Drive, Burke, Va. 22015.

JUNE 18-20, SAN FRANCISCO — **Data Communications I — Basic Concepts.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

JUNE 18-21, NEW YORK — **National Data Base and Fourth-Generation Language Symposium.** Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

JUNE 18-21, SAN DIEGO — **Structured Analysis & Systems Architecture Seminar.** Contact: Jan Crosswhite, Oberland Associates, 4036 N.E. Sandy Blvd., Portland, Ore. 97212.

JUNE 18-22, TORONTO — **Systems Design.** Contact: QED Information Sciences, Inc., QED Plaza, P.O. Box 181, Wellesley, Mass. 02181.

JUNE 18-22, ORLANDO, FLA. — **IDMS-DC Programming Workshop.** Contact: Harris Education Center, 1025 W. Nasa Blvd., Melbourne, Fla. 32919.

JUNE 18-22, WASHINGTON, D.C. — **Unix for the DP Professional.** Contact: Webco Industries, Inc., P.O. Box 15505, 8513 Washington Ave., Alexandria, Va. 22309.

JUNE 18-22, NEW YORK — **Project Management & Control Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

JUNE 18-22, NEW YORK — **CICS Internal Architecture.** Contact: Sysed, One Park Ave., New York, N.Y. 10016.

JUNE 18-22, SAN FRANCISCO — **Advanced Structured Analysis.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

JUNE 18-22, NEW YORK — **Information Modeling Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

JUNE 18-22, CHICAGO — **Systems Workshop II.** Contact: Ware Associates, P.O. Box 948, Groton, Conn. 06340.

JUNE 18-22, BOSTON — **Systems Analysis.** Contact: QED Information Sciences, Inc., QED Plaza, P.O. Box 181, Wellesley, Mass. 02181.

JUNE 18-22, DALLAS — **Structured Analysis for Real-Time Systems.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held June 18-22 in Boston.

JUNE 18-22, SEATTLE — **Structured Analysis and System Specification Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

JUNE 18-22, CHICAGO — **Structured Design Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

JUNE 19, NEW YORK — **Spreadsheets Using Lotus 1-2-3.** Contact: Center for Advanced Data Processing, Inc., Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

JUNE 19, DENVER — **Lotus 1-2-3.** Contact: Software Institute of America, 8 Windsor St., Andover, See JUNE page 72



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## NEWS

**JUNE** from page 71

Mass. 01810.

**JUNE 19, NEW YORK — Introduction to Knowledge-man.** Contact: Center for Advanced Data Processing, Inc., Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

**JUNE 19-20, MONTEREY, CALIF. — Software Strategies for the IBM World.** Contact: Art Solomon, Gartner Group, Inc., P.O. Box 10212, 72 Cum-

mings Point Road, Stamford, Conn. 06940.

**JUNE 19-20, NEW YORK — Office Automation.** Contact: Yankee Group, 89 Broad St., Boston, Mass. 02110. Also being held June 26-27 in Palo Alto, Calif.

**JUNE 19-21, ROSEMONT, ILL. — The Office Information Systems Conference.** Contact: Janet Schafer, Cahners Exposition Group, Cahners Plaza, P.O. Box 5060, 1350 E. Touhy

Ave., Des Plaines, Ill. 60018.

**JUNE 19-21, TORONTO — The Third Canadian CAD/CAM & Robotics Exhibition and Conference.** Contact: Computer and Automated Systems Association of SME, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

**JUNE 19-22, CHERRY HILL, N.J. — Implementing Local-Area Networks.** Contact: Ruth Dordick, Integrated Computer Systems, P.O.

Box 45404, 6305 Arizona Place, Los Angeles, Calif. 90045. Also being held June 26-29 in San Diego, Calif.

**JUNE 19-22, WASHINGTON, D.C. — Distributed Processing, Mini and Microcomputer Implementations.** Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45404, 6305 Arizona Place, Los Angeles, Calif. 90045. Also being held June 26-29 in Boston.

**JUNE 19-22, BOSTON —**

**Microprocessor Software, Hardware and Interfacing.** Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45404, 6305 Arizona Place, Los Angeles, Calif. 90045.

**JUNE 19-22, CHERRY HILL, N.J. — Designing with 16-Bit Micros.** Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45404, 6305 Arizona Place, Los Angeles, Calif. 90045.

**JUNE 20, TORONTO — An Integrated Approach to Distribution/Logistics.** Contact: Distribution Management Systems, Inc., 81 Hartwell Ave., Lexington, Mass. 02173.

**JUNE 20, NEW YORK — Introduction to Dbase II.** Contact: Center for Advanced Data Processing, Inc., Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

**JUNE 20, NEW YORK — Word Processing With Wordstar.** Contact: Center for Advanced Data Processing, Inc., Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

**JUNE 20-22, COLUMBUS, OHIO — VM/SP Structure, Flow and Tuning.** Contact: Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

**JUNE 20-22, BEIJING, CHINA — The First International Conference on Computers and Applications.** Contact: IEEE Computer Society, P.O. Box 639, Silver Spring, Md. 20901.

**JUNE 20-22, KISSIMMEE, FLA. — The 14th International Conference on Fault-Tolerant Computing.** Contact: IEEE Computer Society, P.O. Box 639, Silver Spring, Md. 20901.

**JUNE 21, NEW YORK — Lotus 1-2-3 Applications Development.** Contact: Center for Advanced Data Processing, Inc., Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

**JUNE 21, DALLAS — Dbase II.** Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

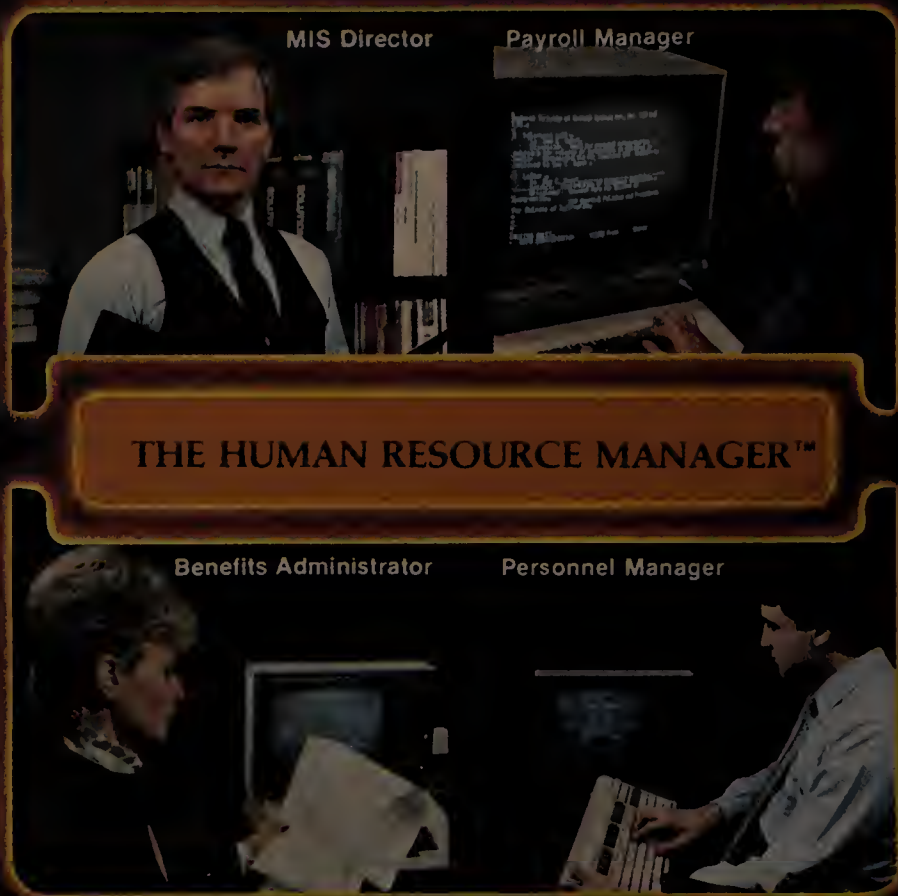
**JUNE 21-22, SAN FRANCISCO — International Communications: Products, Technology and Regulation.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

**JUNE 21-22, BOSTON — Personal Computers in the Corporate Data Base.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

**JUNE 21-22, WORCESTER, MASS. — Microprocessor Technology.** Contact: Worcester Polytechnic Institute, Worcester, Mass. 01609.

**JUNE 22, NEW YORK — Crosstalk-XVI.** Contact: Center for Advanced Data Processing, Inc., Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

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It's the 3B2/300. From AT&T.

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They're the 3B5/100 and 3B5/200. From AT&T.

They can be configured to suit customer needs with a wide variety of I/O, peripheral, memory, and communications options for cost-effective growth. This makes them good investments for your customers.

These computers fit neatly into the office environment. And are incredibly quiet, cool, efficient, and plug into standard wall outlets.





# 3B20S

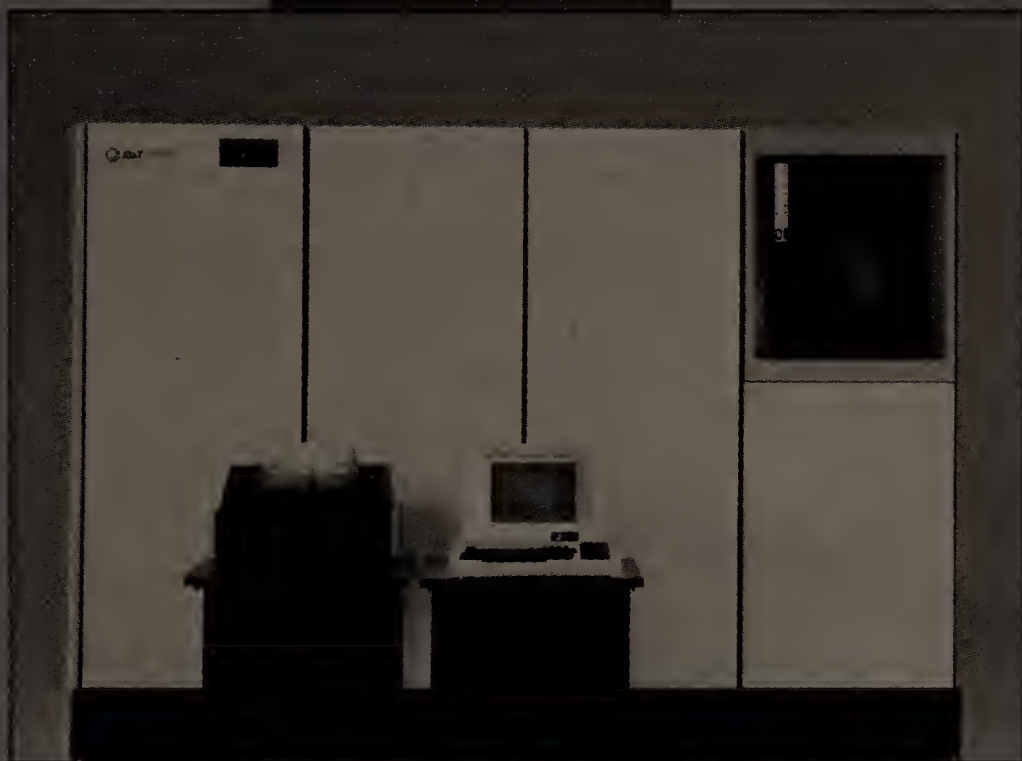
The 3B20S computer is the high-end sup of the 3B family. It runs UNIX System V and designed to meet the rigorous needs of data centers, developers, office service organizations, and manufacturing locations.

When a customer outgrows these capabilities, you simply add the attached processor forming the 3B20A. And add up to 80% to your performance range. Or you can begin serving your needs with the 3B20A right from the start.

And the growth from the 3B20S to the 3B20A occurs as painlessly as possible with only a modest increase in cost.

Both computers are energy efficient and easy to install. They perform without complex and expensive environmental controls. And unlike most computers of this capacity, the 3B20S and the 3B20A do not require air conditioning or raised floors.





# 3B20D

It is a powerful, 32-bit super minicomputer that will set a new standard for uptime. It runs the new UNIX RTR operating system, providing time-sharing and introducing real time and fault-tolerant features.

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**AT&T**



## NEWS

# Service up, inventory down after system installation

CHICAGO — Customer service levels are going up while inventory levels are coming down as a result of the installation of a computer system at a pipe products manufacturing company here.

At the Continental Pipe Products Mfg. Co., a Wang Laboratories, Inc. 2200 computer is helping to produce speedier order turnaround, more current billings and collections and the potential for future economic growth without a proportional increase in staff.

Organized in 1933 as a manufacturer and fabricator of steel pipe nipples, Continental Pipe Products (formerly Continental Nipple Mfg. Co.) has grown to become a major manufacturer and distributor of all types of high-quality steel, iron, brass and aluminum pipe fittings.

Currently employing 30 people, Continental has increased annual sales from \$2 million to \$6 million since 1975. The company stocks more than 11,000 products in two warehouses in Chicago and 14 other warehouses located throughout the country and provides service to more than 1,700 customers in the U.S., Canada, Mexico, Europe and the Far East through Continental Pipe Products International, Inc.

## Outdated methods

With continued growth, manual methods previously employed at the company became increasingly inefficient and resulted in a loss of business knowledge when longtime employees retired, according to James Hirsch, Continental's vice-president. Adding to the shortcomings of these methods were the recessionary conditions of recent years.

"Economic times dictated that our business become more efficient," Hirsch said. "Because we were doing business in the fast lane, it became mandatory to use 20th- rather than 19th-century business methods."

According to Hirsch, Continental's main focus was on the automation of inventory control operations because of the company's multiple, decentralized warehouse locations. But the company was also interested in developing automated order entry and accounts receivable operations.

## Hardware reliability key

Continental investigated the systems of a number of different vendors. Major selection criteria included reliability of hardware, ease of programming and comprehensiveness of software capabilities.

Based on these factors, the company decided to install the Wang 2200 system. "Other vendors had similar equipment," Hirsch said, "but Wang provided the knowledge and expertise we were looking for."

Consisting of a central processing unit with 128K bytes of memory, 10M-byte fixed/removable and 1M-byte floppy disk drives, two printers and five terminals, the Wang 2200 system operates with integrated, on-line software systems, provided by The Office Manager, Inc. (TOM) of Seattle. The software systems include an inventory control package with remote warehouse telecommunications capabilities and order entry/invoicing and accounts receivable modules. A report generator that makes it possible to produce special as well as

routine reports is also provided.

Delivered in 1981, the conversion to the system was completed in November of 1982. Continental was aided during conversion by Gleeson, Sklar & Sawyers, a Chicago accounting firm and licensed Wang/TOM software consultant, which now maintains and supports the system.

"We were able to convert fairly easily because our previous manual operations were basically well organized," Hirsch said. "Even though we lacked previous data processing background, we were able to learn system operations based on training and documentation. Easy to use and operator-oriented, the system pro-

vides prompts for every transaction."

According to Hirsch, "customer service levels are 10% higher than before. We're now shipping 80% to 85% of our orders complete."

"We're also achieving faster order turnaround," he continued. "We've always had 48-hour turnaround, but now we're handling orders in 24 hours and moving even quicker in processing rush orders."

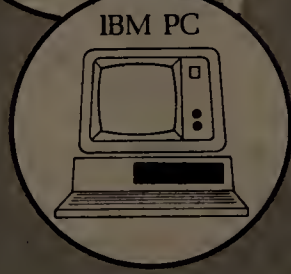
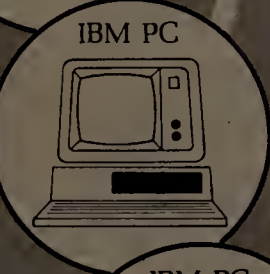
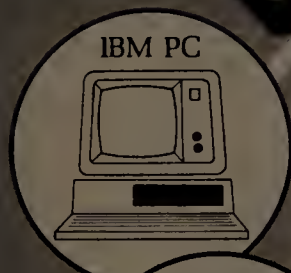
"Inventory levels are simultaneously being reduced because we now have better, more accurate and more up-to-date control," he said. "In addition, physical inventories are now conducted faster, taking only

one instead of six days.

Billings and statements are also produced more efficiently, Hirsch said. "As a result of these improvements, plus the availability of more detailed and current accounts receivable aging reports, collections have increased at least 5% and possibly as much as 10%," Hirsch said.

The system will be used to increase customer service levels while reducing inventory levels in the future, according to the vice-president. Continental may also install other system modules for handling accounts payable, more detailed sales analysis, purchase orders, sales commissions and general ledger.

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# EDITORIAL

## Let's err on the side of caution

The founding fathers of regulation subscribed to lofty ideals as they stood vigilant more than half a century ago, watching the phone company swallow its competitors en route to becoming the largest regulated monopoly in history.

A closely guarded monopoly, they felt, would give rise to a network that would develop into a uniform communications backbone serving strategic as well as commercial interests. Such interests, they also felt, would be further promoted by the de facto standards that a monopoly provider of communications would foster.

The remainder of this decade, the decade of divestiture, will be marked by a communications explosion, with several AT&T competitors, like United Telecommunications, Inc., eagerly assembling their own networks [CW, May 7]. Others, like MCI Communications Corp., are stuffing every available cent they have into the expansion of existing networks as they prepare to take on AT&T in today's less regulated, more competitive arena.

With all this frenetic activity, one might wonder whether the old concerns for standards and uniformity will prevail. The answer is that, in the long run, these concerns will prevail because they have to. Viable and uniform networks are and will continue to be absolutely vital to our commercial and strategic interests, proof that the regulatory founding fathers, indeed, correctly gauged the future of communications.

But what about over the short run, in which the markets (and vendors scrambling for positions within them) are in such a state of flux?

With the great push for freer communications markets and with the attendant benefits of competition being touted by everyone and his uncle, we must not lose sight of the reasons communications vendors came to be so highly regulated in the first place.

Hardly a week passes without *Computerworld* running an article based on someone's plea for further communications deregulation. Many of those pleas are based on sound reasoning. There is a danger, however, of being swept away by the deregulatory rush, especially in cases where politics and regulatory practices mix.

The watchwords when it comes to the continuing deregulation of the communications industry, therefore, should be "prudence" and "conservatism." It took nearly 100 years to build the communications monopoly structure; it will take a comparative blip on the time line to disassemble and restructure it. If there is an error made in this restructuring, let it be on the side of caution.

*Jim Ryon*  
Computerworld



Zeroing In?

## LETTER

### On the issue of hacking: 'Are we not responsible for our own actions?'

In response to Howard A. Karten's letter to the editor [CW, April 23] about high school hackers, should a school, or any institution for that matter, reward thieves, cheats, liars and those who act wickedly, dishonestly and deceitfully? Since when were fraud and espionage "characteristically American?" Is it the school's (or society's) responsibility to be "sufficiently stimulating or motivating," or must we, as individuals (including the bright, but not so honorable, student), employ virtues such as self-discipline, self-control and self-motivation? Are we not responsible for our own actions?

Yes, I recall our "government illegalities." I recall resignations, humiliations, prison sentencing, endless investigations and a public outcry that echoes even today.

Politico-religious-imposed morality and author-

ity? You bet! It appears to be in woefully short supply today.

The school district was gracious to the misguided, but deceitful, student by giving him the opportunity to get counseling rather than exercising the traditional discipline of expulsion.

**George T. Kramer**  
Columbus, Ohio

*Computerworld welcomes letters from its readers. Preference will be given to typed, double-spaced letters of 150 words or less; they may be edited for the purposes of clarity and brevity.*

*Letters should be addressed to Editor, Computerworld, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.*

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# VIEWPOINT

## Info centers: Precursors of effective DBMS efforts



### THE DATA CENTER

John P. Murray

*This is the first in an eight-part series.*

It can be quite effective, and the results that can be produced with it can be dramatic, yet the information center should come to be viewed as the precursor of an effective data base management system (DBMS) effort. As the DBMS evolves, the information center should become an ancillary, albeit important, component of the DBMS effort.

Today, there are certain functions — such as graphics, automated spreadsheets, modeling and forecasting — readily available under an information center process that are not yet available in at least some of the fourth-generation programming languages that are a feature of data base systems. Because this is the case, and because the information center can produce dramatic results in a very short time, the information center is a viable and practical option.

However, as the use of data base-connected, fourth-generation languages grows, it is certain the languages will be improved and expanded.

When this occurs, the organizations that have taken the correct approach with a sound DBMS will be able to offer all of the functions and benefits of the information center. At that time, considering that the bulk of the organization's data has been put under the DBMS, it will make sense only to phase out the information center in favor of doing most of the interactive work under the DBMS.

Therefore, the information center, with all its obvious advantages, should be viewed as the means to provide expanded MIS support and service to MIS clients while the DBMS environment is

being designed and installed. Success with the information center, which is very easy to accomplish, will not only produce good press for MIS and increase its credibility with MIS clients, but it should also be viewed as a vehicle to begin to pave the way for the various cultural changes that will occur as the DBMS and the development of the interactive processing environment grow within the organization.

The acceptance, installation and eventual effective use of a DBMS must, given time, become a reality in all organizations. It has to happen; the benefits to be obtained are simply too significant for that not to occur. Clearly, this is an issue that must be given appropriate attention and not only in organizations in which a DBMS has been installed and the function has been allowed to atrophy.

Not only are there organizations that have gone to the considerable expense to install a DBMS and that have not moved ahead or made any real progress with the package, but there are organizations that have compounded the problems by installing several different DBMS, and they still make no real progress.

### Ability to provide leadership

The ultimate success or failure of the DBMS depends upon the ability and willingness of the particular organization's MIS management team to provide the leadership required to bring it all together and to make progress. Doing this is a long-term, expensive, frustrating and time-consuming process, but the eventual benefits to the organization are worth all the pain.

Having spent the better part of the past three years directing the simultaneous development and expansion of both an information center and a DBMS has provided a great deal of insight into the issues that arise. A great deal of the effort is, indeed, evolutionary in that the successful completion of each phase opens new areas and presents new challenges.

I would, then, like to devote several columns to consideration of some of the issues we have encountered during our DBMS development effort.

These are universal issues; being aware of them prior to their becoming concerns within the organization can help smooth the transition to a true interactive information processing environment. The better prepared those who have to deal with these issues are, the greater will be their DBMS success.

Several issues will not be considered in this series. First, no recommendations will be made about the type of data base system to select or the vendor with which to deal. The salient consideration with the DBMS selection must be to begin by having a clear vision of what the DBMS is to accomplish within the organization and then to select the best possible system based upon that vision.

Technical issues will also not be considered. If a good DBMS is chosen, if a good data base staff is built and if appropriate management direction is provided to the endeavor, the technical issues, while they will still require commitment and hard work, can be left to the technicians, and all will go well.

The management, emotional and political issues of the DBMS will be given attention in this series. This is simply because these are the salient issues surrounding the success or failure of the development and continuing growth of an interactive processing environment.

The goal here is, if possible, to make the process less painful for others. We are, after all, all in this thing together; if we can learn from someone else, so much the better. Reflecting upon the progress we have made, there is very little I would do differently were I to start over.

I do not claim that what will be presented in this series is the only way to move to a DBMS or that what will be presented is the best way to build a strong DBMS environment. However, that which has been discovered as the result of great effort and, at times, stress, is worth considering by those engaged in such an effort or those contemplating such a venture. It is my hope that these observations can be of help along the way.

*Next: How to tell if your DBMS venture will be successful.*

## Commonsense ways to improve DP documentation



### HUMAN CONNECTION

Jack Stone

The pressures of systems projects push documentation tasks way down in the work queue, but there is no excuse for turning out paperwork fit for neither man nor beast.

Analysts and programmers know full well that write-ups are essential ingredients to the understanding and functioning of large systems, but too many cannot, will not or do not make the little extra efforts to make such write-ups useful. So I've provided hereinbelow some simple editing and organizational techniques that should make the manuals more acceptable — and that don't cost an arm and a leg in time, money or energy. I'll use as an example a manual that supports the largest data processing system in existence, the Internal Revenue Service's, and brilliantly exemplifies in living black and white precisely how not to prepare data processing documentation; its title is "Tax Guide for Small Business," No. 334. Having just completed my annual bout with the monstrosity for my 1040 Schedule C, I am well prepared emotionally to discuss it.

Here are my suggestions:

■ Produce individual manuals for the different classes of user personnel who interact with the system, namely, operators, administrators, managers, executives and so on.

The 334 packs, between one set of covers, provide guidelines for each of the three major forms of business organization: corporations, partnerships and individuals. Of course, business taxpayers have interest in only their forms, but they are forced to wade through material that is irrelevant.

Buried in the bowels of the book is a chapter on the differences between the tax law and regulations for the various forms. Of course, the chapter makes sense only to the lawyers and accountants who understand the details of these forms and not the businessmen for whom 334 is intended.

■ Document all the functional changes in updated editions, and place them in the sections in which they occur.

The IRS groups such changes in the front of the book, where they are not segregated by form of organization and are, therefore, difficult to sort out; are too remote from the details and are impossible to interpret; and do not include certain items that are most important to businessmen, like the new restriction in 1983 on daily meal allowances of \$14, down from "that which is reasonable."

■ Make certain that ideas follow each other in a logical way, and use paragraph and subparagraph headings in a consistent and clear fashion to render the ideas clear. In addition, use boldfacing, italics and so on if you're in the word processing major leagues.

The IRS uses varsity WP play with its special type fonts, but its editor disorganizes ideas into a jumbled morass. Too often, I've stumbled over whether a subparagraph is a subsidiary or a new topic because its theme was not obviously consistent with that of the subsection.

■ Segregate the exceptions from the rules.

The IRS falls into the same trap as many DP centers: It intermixes the components of the rules with the exceptions to the rules, with resulting rank confusion. A documentation editor should first present all the rules — or policies, procedures and so on — clearly, briefly and simply, organizing them into units where appropriate. Then each one should be expanded upon in explanatory sections wherein exceptions are presented, plus examples, references, completed forms and any other information that would clarify it.

■ Be liberal in the use of tables of contents and indexes.

The 334 contents page is far too skimpy, and its indexing is much too cluttered. If the editor prefers a thin contents page, then the contents of each chapter should be detailed at the beginning of the chapter, because readers need all the help they can get to find their ways through the text. Also, it is not mandatory that a single index be used for all topics to be keyworded.

For example, multiple indexes focusing on form numbers, references, tables, figures, acronyms and so on can reduce the fog factor of an index and increase readability. And they are no trouble to create, what with all the personal computer software around these days to handle the job. ‡

*Stone is an independent management consultant, educator and writer, specializing in DP human communications and personnel development, based in Washington, D.C.*



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## VIEWPOINT

# Do micros offer adequate training for DP grads?



**READER'S  
PLATFORM**  
LeRoy Walton

Since the inception of microcomputers on the market in 1975, there has been a continuing steady decline in their cost. This is especially true as a tacit price war in the microcomputer industry rages on. We have also experienced a continuing increase in the memory capacity, performance and programming capability of these machines.

For example, many are now courting 32-bit architectures and multi-

tasking operating systems.

Micros are so affordable and useful today that in many institutions of higher learning, students must meet a prerequisite of possessing microcomputers for certain or even all academic programs.

For example, in September, Harvard Business School will require 780 entering students to use IBM Personal Computers. The school will make the units available at a discount, and professors will be urged to buy them.

While all this has been materializing, education itself has continued to face a tightening of purse strings. This puts an ever-increasing temptation upon higher education to utilize

the microcomputer — as opposed to the minicomputer or mainframe — in teaching undergraduate computer science courses.

## Adequately educated?

But the question arises whether an undergraduate computer science major can be adequately educated with the microcomputer alone.

To address this matter properly, those of us in education must answer the following question: "What should our posture in higher education be with respect to the use of microcomputers?"

I have investigated the willingness of computer science graduate

schools, as well as industry, to admit and hire, respectively, an undergraduate computer science student educated exclusively on a microcomputer.

A survey was conducted throughout the U.S. of computer science graduate schools' department chairmen and heads of information systems departments. Examples of microcomputers mentioned in the survey were Apple Computer, Inc.'s Apple IIe and Macintosh; IBM's Personal Computer; Radio Shack's TRS-80 Model 2000; and Commodore Business Machines, Inc.'s Commodore 64.

## Limited, biased in learning

Approximately one-half of the graduate schools felt that the student who was educated solely on a micro would be limited and biased in his learning. This would especially be true in advanced areas such as operating systems, data base processing and teleprocessing. Some of the graduate schools did indicate a feeling that with the proper selection of microcomputers, such as Motorola, Inc. 68000-based supermicrocomputers, many deficiencies would be eliminated. In fact, some indicated an intent on their parts to utilize in the near future more supermicrocomputers, such as the 68000-based system.

It was felt, too, that in two to three years, the availability of hardware and operating systems on microcomputers would be much richer. Therefore, at that time, no problem should exist with respect to computer science graduate schools' acceptance of students without makeup work, even though the students were educated solely on microcomputers. An example we see today is the rapid proliferation of the Unix-based operating system.

The remaining graduate schools indicated a complete willingness today to admit someone educated only on a microcomputer.

## Experience with micros

One major southeastern university commented that "there would be no problem with students whose undergraduate laboratory experience was restricted to microcomputers entering our graduate computer science program. This is, of course, as long as they had the appropriate courses."

It was very noticeable that all the surveyed graduate schools did have mainframes and microcomputers. All except two schools had minicomputers used for research by faculty and graduate students.

All computer science graduate schools were in total agreement with two things:

■ No matter what schools' postures are, industry would be quite unhappy with the thought of hiring a person trained exclusively on a microcomputer.

■ It is becoming increasingly possible to teach all computer science "concepts" academically, at least, on upper end microcomputers.

Let me now turn to industry's posture. Each organization looked very

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Walton is a professor in the department of computer science and quantitative methods at Troy State University in Troy, Ala.



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VIEWPOINT

GRADS from page 84

unfavorably upon the possibility of its hiring an undergraduate computer science major educated on a micro-computer alone. It was evident that the likelihood of such a student being hired by the companies surveyed would be very remote. Each organization indicated that prospective data processing employees need to have exposure to a mainframe or upper end minicomputer as well.

According to one major Fortune 500 company, "The question of the value of a computer science graduate having only microcomputer programming skills is better put into perspective with some knowledge of our department's setup. The growing need for micros was realized over a year ago. Several departments had re-

quested some type of support to fit unique requirements. The information center was opened for business at that time.

"Our data processing department hired one programmer to assist users with the data processing requirements for those machines. His primary function is to direct and assist other personnel in the proper usage of the equipment," the firm said. "The hardware currently being used is the IBM Personal Computer. The software is canned, commonly used, industrial packages, such as Lotus Development Corp.'s 1-2-3, Visicorp's Visicalc and Micropro International Corp.'s Wordstar. Training packages have also been obtained and installed to assist in user orientation. User departments within the company are responsible for the scheduling of us-

Response	Industry		Government	
	Number	Percent	Number	Percent
Micro acceptable (prefer micro)	1	.72	0	0
Micro acceptable (prefer mainframe or mini)	7	5.04	1	9.10
Micro marginally acceptable (prefer micro)	2	1.44	0	0
Micro marginally acceptable (prefer mainframe or mini)	12	8.63	5	45.45
Micro unacceptable (prefer mainframe or mini)	117	84.17	5	45.45
Total	139	100	11	100

Figure 1

age of the microcomputers and data retention.

"A computer science graduate with an education based only on microcomputers would be ill prepared for the data processing industry. He would need additional major training in order to become effective with higher level hardware and software. Graduates possessing mainframe programming experience are in great demand," according to the company.

The survey obtained from industry and government agencies was sent to 300 organizations listed in the *College Placement Annual*. Of the 300 mailed, 42 went to government agencies. The respondents included 139 from industry and 11 from government agencies (see Figure 1, which indicates the statistical results).

From this survey, one can see that placement of graduates would be a problem today. I feel the reason is that the majority of users "use" microcomputers — that is, they allow users to be more personally productive. Programmers do not normally program them. Instead, most programmers are hired to program mini-computers and mainframes.

Programming concepts can, to a certain extent, be taught on microcomputers. Industry might then pick up the remainder of the educational process — that is, using the concepts. But is this too big an investment for industry?

There is one very important thing that we as computer science educators can learn from this and should remember. An educational institution's primary responsibility is to provide a graduate with a set of marketable skills as defined by the prospective employer, whether that prospective employer be industry, a graduate school or whomever. Thus, it is imperative, as the survey illustrated, that a student be exposed in his undergraduate computer science curriculum to microcomputers and, preferably, to a mainframe rather than a minicomputer. To prevent a disservice to the student and ourselves, it is our responsibility as educators to ensure a student's exposure to both levels of computers. The time has not yet arrived in which one can adequately produce a marketable product by using microcomputers alone.



The Big Bank Boom

Will their bubbles burst?

ORLANDO, FLA. — It's 1984, a time when all of us must consider the harsh and radical realities facing today's financial marketplace. For what was once a fairly predictable and immensely profitable business has, over the past five years, become a turbulent battlefield upon which our banking institutions daily fight for survival.

Why? First off, powerful new non-bank competitors have raised their heads above the regulatory ruins to challenge the once exclusive concept of banking services. Secondly, the traditional geographical franchise is slowly disintegrating as mergers and acquisitions dominate the financial headlines. And finally, today's customers — particularly those most highly valued by the industry — are at once far more sophisticated and far less faithful to their hometown lending institution.

Leading the fray and, so far, managing to keep heads above the horizon, are America's "big banks" — those 300+ institutions with deposits ranging from \$700 million on up to \$80 billion. Like those "best run companies" profiled in the Peters-Waterman bestseller, *IN SEARCH OF EXCELLENCE*, many of these big banks practice the techniques so essential to achieving and maintaining success: the consistency and quality of their service; the immediate attention they pay to customer needs; the constant consideration for their employees; and a clear, well-defined focus on their specific business objectives.

But is all that enough to keep the big bank off the battlefield? Hardly. Technology is the one weapon that promises to protect and advance these financial giants against any and all future comers. In fact, it has been said that the computer is to the banker what the production line was to the manufacturer: a cost-effective tool that provides the capacity to handle more business than ever was possible before!

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Big Banks (from page 1)

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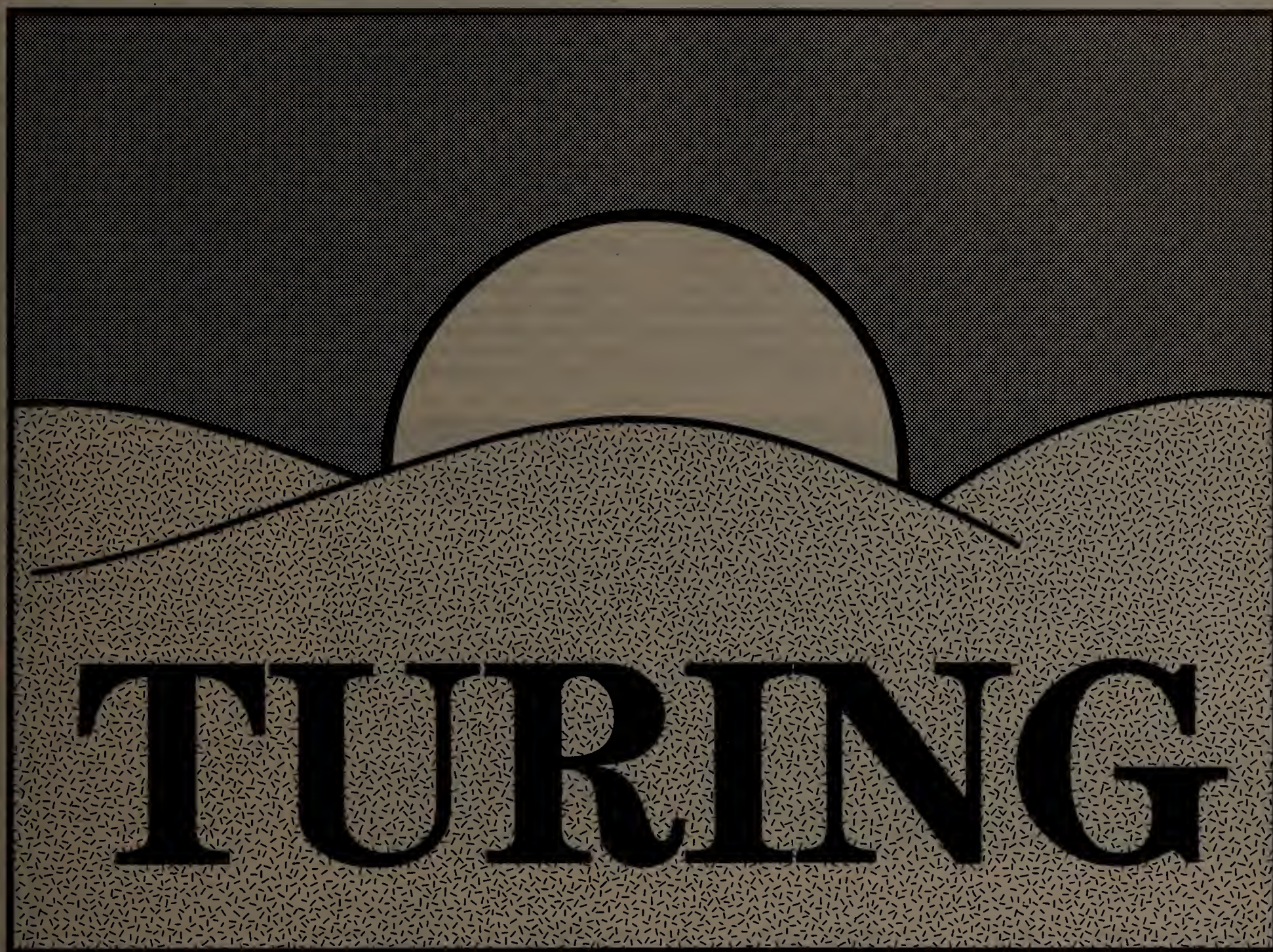
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## IN DEPTH



COVER DESIGN COURTESY OF RESTON PUBLISHING CO.

## An inside look at the genesis of a programming language

By Richard C. Holt

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***The mood of the project is contagiously enthusiastic. We eat lunch regularly at various Chinese restaurants and unwittingly entertain other patrons with loud, jargon-filled arguments about import lists and the format of token streams.***

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*Turing, a new general-purpose programming language, was born out of an intensive one-year development effort by a research team at the University of Toronto. Richard C. Holt, chairman of the university's Computer Systems Research Group, joined forces in 1982 with fellow computer science professors Jim Cordy and J.N.P. Hume to develop the Turing language.*

*Named in honor of British mathematician and computer theorist Alan Turing, the language is said to be useful for basic data processing, microcomputer and scientific applications.*

*In this article, Holt describes what it took to create Turing and recounts some of the personal stories behind its technical development.*

**A quiet summer.** It is summer 1982; Jim Cordy and I are enjoying a bit of a lull. Our development project, leading to the systems programming language, Concurrent Euclid, is receiving a warm acceptance. Universities are using it in advanced courses, and companies are using it for production software. But lulls are not a way of life around the Computer Systems



IN DEPTH/GENESIS OF A LANGUAGE

Research Group, where people jokingly quip, "If it works, it's obsolete." Frantic activity is more the norm, and a new project is brewing.

Prof. Tom Hull wants to know how the University of Toronto is going to teach computer science using interactive systems. Programming has been taught for a decade at the university using batch processing with PL/I (actually SP/k and PL/C). Tom suggests developing an interactive PL/I system for Digital Equipment Corp.'s VAX.

I disagree. To me, PL/I is a fatal disease, a complex mess, a necessary evil that was useful for introducing structured programming in the '70s. In PL/I you write  $I=J=2$ , and no one can guess what it means (it compares J to 2 and sets I to 1 or 0). You write  $25 + \frac{1}{2}$ , and you get either

an overflow or the wrong answer. No, I argue, it is time for something better.

Possibility of Pascal

I suggest using Pascal, with its elegance and available compilers. Tom says no; a language is needed that is more powerful than Pascal. With Dr. Niklaus Wirth's definition of Pascal, he points out, the students can't write matrix multiplication; they can't use exponentiation. They can't even write a "put message" procedure.

Pascal has long been my favorite language, but I worry that its I/O and string manipulation are too clumsy; they cause students to concentrate on details rather than mastering programming principles.

Still, Pascal seems to be the best

available choice.

Tom suggests using Euclid. It is a fair question, because I have been loudly preaching the advantages of Euclid for producing modular, efficient and highly reliable programs. I tell him that although Euclid is lovely, it was designed for systems programming, not general-purpose programming. My explanation bothers me. After all, Euclid is a good language. Is it possible, I wonder, to mold Euclid into a general-purpose language?

**Easier than Basic.** In the meantime, my son Adam, 10 years old, has learned to use Basic on our home computer. He creates mesmerizing swirls of color on the screen, as well as making the thing talk and play music. I explain to Adam that Basic is crude, that programming in Basic

is like trying to swim in spaghetti and meatballs. I decide it is time to set Adam on the road to correct programming. I decide to teach him Pascal. Together, we develop the Pascal program that prints Hello. There, I say, isn't that nice?

Adam is not impressed. Why, he asks impatiently, do you have to type all that just to print Hello? Well, I explain, there is one line to say it's a program, one line to say it has a beginning, one line to say print Hello, and one line to say it has an end. "Four lines to say Hello?" he asks. "In Basic you just type one line."

I am getting ready to launch a discussion on the virtues of structure, top-down programming and so on, but it seems that Pascal and I have lost credibility in the eyes of our 10-year-old audience.

I can't help thinking that Adam is right. The fact is, Basic excels at minuscule programs. And many programs are minuscule, especially student programs. But Basic programs longer than about a page tend to be mind scramblers — not a good thing for the serious programmer and certainly not a good thing for the student. Is it possible, I wonder, to have a language that is easier than Basic for small programs and yet more powerful than Pascal?

**Hatching the chicken and egg.** The university receives a gift from IBM: a 3033 computer (370 architecture). This means the university cannot standardize on VAX interactive software. There is no compatible software that we can use on both the 3033 and the VAX. This situation provokes me into proposing a new language.

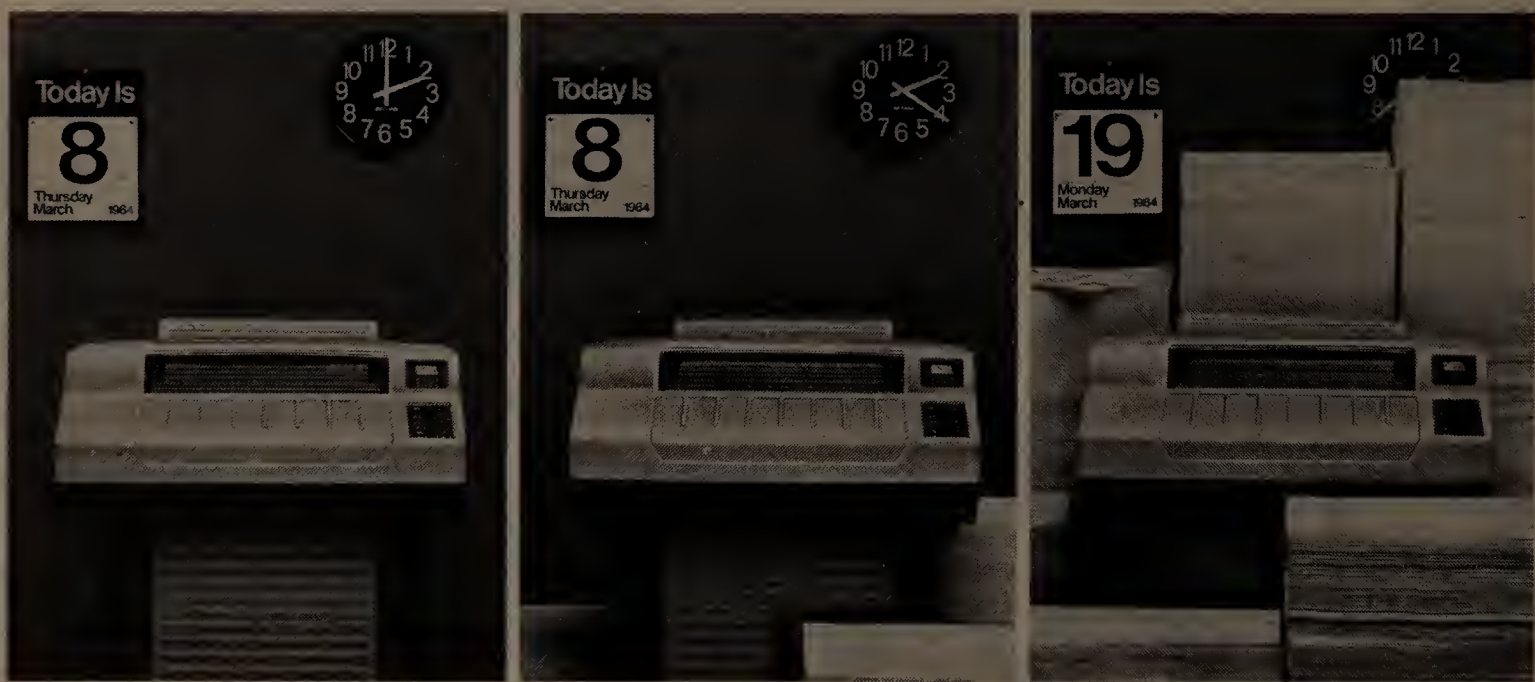
I suggest to Jim Cordy that we create a new language to run on these two architectures (370 and VAX). He points out that even if we designed the language and developed the compilers, it would be of no use without a textbook. Prof. Pat Hume and I have co-authored several books, so I ask him if he would work with me on a textbook for the new language. He expresses some interest, but points out that a textbook is of no use without classes to utilize it.

Next, I ask Al Borodin, department chairman, what the chances are of switching to the new language. He thinks it might be possible, but points out that the department could not consider a new language without a textbook and solid compilers.

It's a chicken-and-egg problem: How does one simultaneously create both chicken and egg (compiler and textbook)? Will anyone use them anyway? Certainly there is no chance of acceptance unless the product is clearly better than other options. Even if it is better, some people feel strongly that the university should not be an island, that it should not use a language unless it is widely accepted.

With a Machiavellian twinkle in my eye, I tell Jim and Pat that Al thinks the department can be expected to use the new language. I tell Jim and Al that Pat and I will get the book done. Jim and I will take care of the language and compiler.

Pat and I go to our publisher, Reston Publishing Co., and convince them to publish our yet-to-be-written textbook for a not-yet-designed language supported by not-yet-developed compilers for an uncommitted computer science audience. Jim and I submerge ourselves in a four-month,



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## IN DEPTH/GENESIS OF A LANGUAGE

nonstop debate that our secretaries believe is an ongoing feud, but which is actually our way of designing a language.

**Language goals.** We want to produce a better language, with good compilers, for use in classes next year (September '83). The language must be easy to use and learn, but it should not be just a teaching language because then it would never gain wide acceptance. The language must incorporate the state of the art, the hard-won software wisdom of the '70s: modules with "information hiding," complete but optional run-time checking, precise language specification as in denotational semantics and program verification supported by proof rules.

It must obey the "no surprise" rule, meaning users should not write a statement like  $I=J=2$  and have it produce, without warning, an unexpected result. The language and compiler must help the user create reliable programs, detecting bugs early in the development cycle, rather than leaving lurking bugs in production programs.

The language must support highly efficient programs so that users are not tempted to sacrifice reliability and use low-level languages such as assembler or C. It must be easy to compile — after all, we are to produce two compilers, for the VAX and the 370, within the year.

By Christmas '82, Jim and I produce an acceptable draft of the "Turing Language Report," whose early versions have been alternatively blessed and cursed by the "hackers."

**The hackers.** Mark Mendell has developed a reputation as a super hacker, a programmer par excellence, turning Unix inside out if necessary to solve system problems, producing a Concurrent Euclid code generator in two months for the nearly incomprehensible Intel Corp. 432 object-oriented architecture. Mark retires each evening to read an armful of science fiction paperbacks. Jim and I know we will have to rely on Mark to produce the code generator for the new compiler.

Steve Perelgut is a newcomer. He has worked on Bell Northern Research's Protel compiler. It falls to Steve to program the stickiest part of the compilers. He is the person who gets cajoled, coerced and volunteered into developing the semantic analysis pass of the compilers. The danger with semantic analysis is that the language incorporates new concepts: anti-aliasing and elimination of expression side effects.

It falls to Steve to create the required software magic to support these concepts in the compiler. Jim and I worry about Steve because his part is crucial, and yet he's a bit of an unknown. Steve's response to our worries is to ask when we want something done, to finish it on time, to ask again and to finish it again.

The mood of the project is contagiously enthusiastic. We eat lunch regularly at various Chinese restaurants and unwittingly entertain other patrons with loud, jargon-filled arguments about import lists, the format of token streams, grokking transitively imported modules and booting to the 370.

**Sharpest software tools.** We have the best tools available. We have Unix with file-flogging utilities; we use S/SL, the University of Toronto's compiler writing system. It allows us to produce a scanner in a

*It falls to Steve to create the required software magic to support these concepts in the compiler. Jim and I worry about Steve because his part is crucial, and yet he's a bit of an unknown. Steve's response to our worries is to ask when we want something done and to finish it on time.*

few days and a parser in a few more days. Yes, they initially have some bugs, but these are easily spotted and fixed. Yes, the scanner and parser are a bit slow, but there will be time to speed them up later.

The bulk of the compiler is written in Concurrent Euclid, which allows us to isolate implementation details in modules and get extensive compile-time checking, as well as

checked execution during testing. As much as possible, we recycle parts of the Concurrent Euclid compiler, using them to create the compiler for the new language.

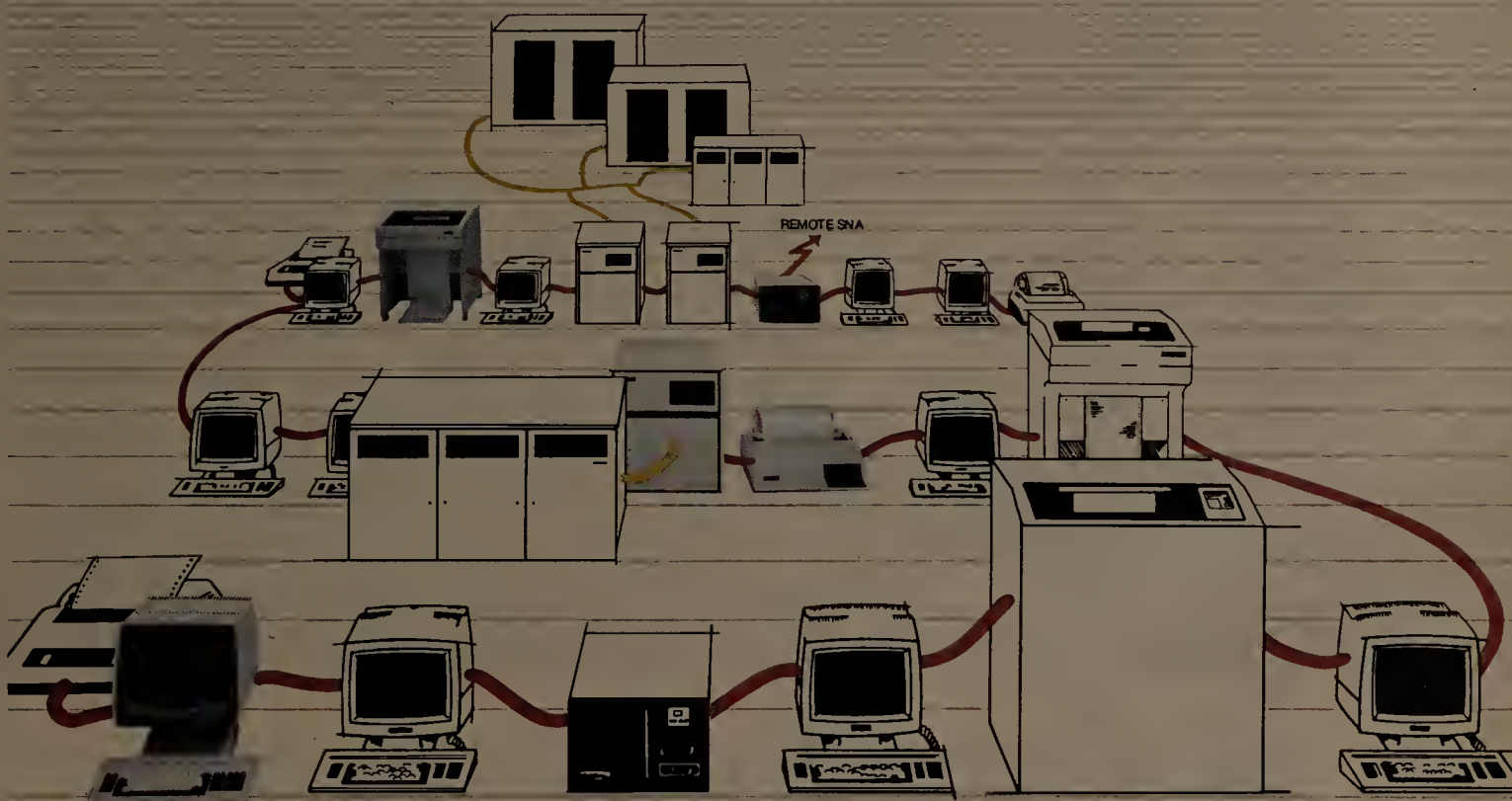
We have ignored Unix's parser generator, YACC, because we feel it cannot produce a production-quality parser for our compilers. We are intrigued by the fact that YACC can detect bugs (ambiguities) automati-

cally in the grammar of a language. So we enlist Philip Matthews, who has been researching program semantics, to see if YACC will accept our language's grammar.

Philip produces a Backus normal form (BNF) grammar for the new language and feeds it to YACC. YACC develops indigestion and rejects the grammar. We point accusing fingers at YACC; it refuses to change its mind, claiming that our grammar is ambiguous.

In the end, we see that YACC is right. Delighted with YACC's computer-generated complaint about the new language, Jim and I redesign the syntax for the troublesome language constructs, and YACC finally blesses our language.

**Baptizing the language.** It is January 1983. Pat says the language



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## IN DEPTH/GENESIS OF A LANGUAGE

*Philip proposes that if Turing is to be a better language, then it must have a mathematically precise definition. I agree in principle, but am doubtful about whether we have the time or resources to produce the definition.*

deserves a decent name. We have been calling it "New Euclid." He explains that it is not just a new version of Euclid, it is a new development, a happy departure, a University of Toronto invention. OK, I say, but all the good mathematicians have been used up: Pascal and Euclid are taken.

We consider calling it von Neumann, but we decide no one can spell it. We ask ourselves: How about something

that relates it to T and U, as in the University of Toronto? And that is how the name "Turing" came to mind. It seemed right: a language named after Alan M. Turing, one of the pioneering geniuses of computer science.

I tell Mark and Steve, who respond with undisguised disgust. They closet themselves briefly and emerge with an alternate name: Jarvis. (Jarvis is a street in Toronto that is well known for

its streetwalkers.)

When I persist with the name Turing, they retaliate by changing our internal documentation to call the language "Jarvis." I suspect the name "Jarvis" lives in hidden crevices in the compiler, but the language is officially baptized "Turing."

**The Matthews plan.** I meet with Philip Matthews and Alan Rosselet in the fall of '82. Alan is doing Ph.D. research on the formal definition of context constraints, such as type checking in programming languages. We have a long discussion about the need for absolutely precise definitions of all details about programming languages.

Philip proposes that if Turing is to be a better language, then it must have a mathematically precise definition. I agree in principle, but am doubtful about whether we have the time or resources to produce the definition. Philip outlines his goal, which we come to call the Matthews plan.

The Matthews plan requires a regular grammar to specify the language's lexical structure, a context-free (BNF) grammar for its syntax, an ADL program (ADL is a notation invented by Rosselet) to define static constraints such as type checking and proof rules to give meaning to the concept of program execution. Thus was begun the project to specify the language mathematically.

### Three projects

We now have three major concurrent projects stemming from the Turing Language Report: the compilers, the textbook and the formal definition (the Matthews plan). The projects turn out to be effective proving grounds for the newborn language; the careful study of the language required by these three efforts helps us to iron out inconsistencies, incompleteness and ineptitudes in the original language design.

**Hume drops the "skip."** Pat Hume is writing a chapter of the Turing textbook. He finds that every example "put" statement ends with the word "skip." He considers this foolish and reacts by removing every "skip" in the chapter.

The result is a nice chapter, containing nice programs for a language that isn't Turing. I complain that a textbook for the wrong language is not going to help much. He complains that it is ridiculous to say "skip" every time you print anything.

Of course he is right. Jim and I retire to debate vociferously about how to get rid of "skip." It takes a month to settle on a good solution. With "skip" eliminated, an entire Turing program to print "Hello" is reduced to a



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## IN DEPTH/GENESIS OF A LANGUAGE



Richard Holt (right) and Jim Cordy

Photo by S. Bekal

single line: PUT "Hello." There is not even a line number; it is simpler than Basic. Pat is happy, and so is Adam.

**Meeting the schedule.** In January 1983 the compiler project begins in earnest, starting as soon as the language is reasonably well defined. I tell Al Borodin (and anyone else who will listen) that we expect to have a compiler for the IBM 3033 to prototype in classes by September '83, but there is a possibility we might have it ready for May '83 summer classes.

I have a schedule drawn on the left side of my blackboard that shows when each part of the compiler must be completed in order to prototype Turing for summer classes in May. Schedules for software projects are a private joke with me because I've drawn them for many projects but I've never seen one followed. With Turing it is different. Each piece falls neatly into place at its prescribed time.

After working on the compiler for two months, it occurs to us that the summer classes can be taught on a VAX. The VAX compiler would be faster to produce because we are using a VAX to support our compiler development, and the VAX has a cleaner instruction set than the 370 for our purposes.

All of the compiler is written in a machine-independent language (Concurrent Euclid); the Turing compiler is identical for the 370 and the VAX except for its code generation pass. We decide to switch our target machine from the 370 to the VAX and continue developing the compiler.

Come May, we have completed most of the Turing compiler for the VAX. It does not yet support some advanced features. It still has some known bugs. It is largely untested. What to do? Use it, of course.

**Summer of '83.** Pat Hume and I now have a usable draft of 14 chapters of the Turing textbook. It has been produced using a computer so we run off a copy and arrange to have it bound locally for summer classes. It will take us a few more months to reach the point where we can typeset the entire book and hand the camera-ready copy to the publisher.

#### Five-course feast

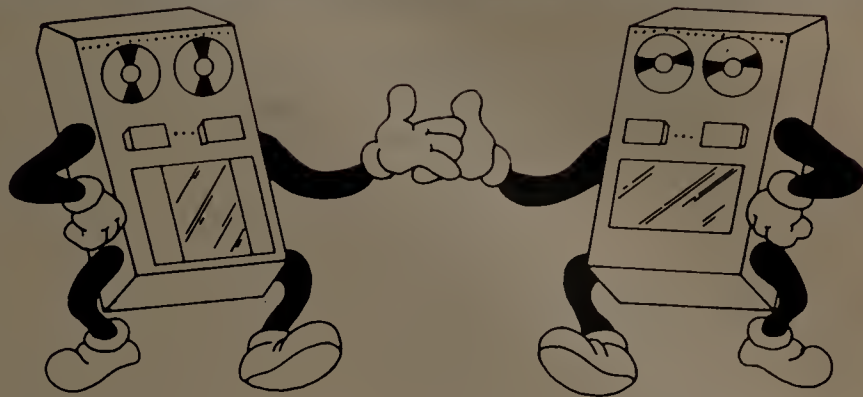
The compiler team is feeling very smug and proud of its raw, new VAX Turing compiler. We congratulate ourselves with a five-course feast of Peking duck. Our new unwritten schedule is simple: By September we are to have a rock-solid compiler for the VAX and a new but usable compiler for the 370.

We ask Steve Tjiang to join the compiler team. He agrees to spend the summer creating the code generator for the 370, while Steve Perelgut and Mark Mendell expand the compilers to handle the remaining language features, speed up the compiler, trim its size and fix its bugs.

Steve Tjiang is well known to us as the undergraduate who explains things to graduate students. In September '83 he will go to Stanford University to become a graduate student himself. Our only worry is that he sometimes creates programs that only he is capable of understanding.

Steve encounters a stumbling block: The assembler on the 370 generates the wrong code for some constructs. Undaunted, he finds the source code for the assembler, corrects it and carries on. We worry momentarily about the fact that our correct assembly language produced by our correct Concurrent Euclid compiler will not be correctly

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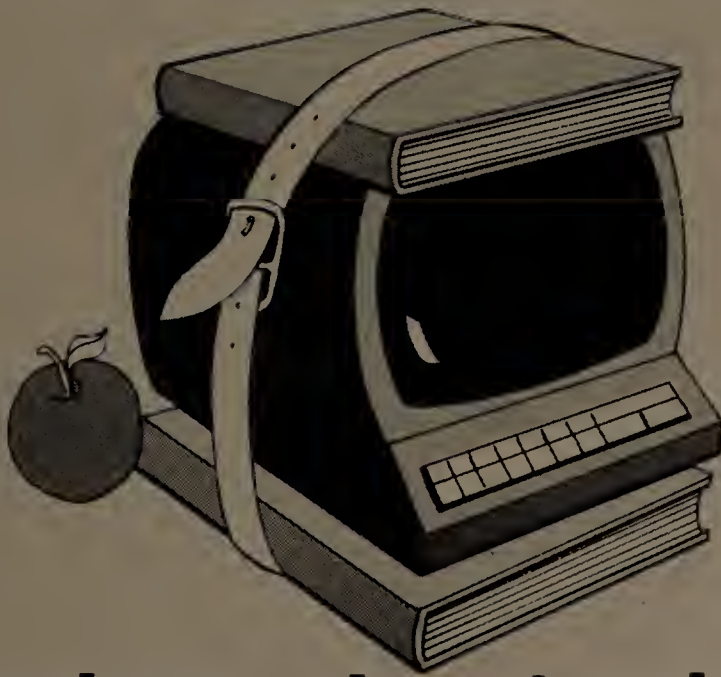
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## IN DEPTH/GENESIS OF A LANGUAGE

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assembled at other installations. We decide to ignore the problem.

September '83. With the arrival of students for fall '83 classes, the VAX version of the Turing compiler is well proven. More important, it has been enthusiastically received by the students and professors. The Computer Science Department is visibly excited at the prospect of using the new language.

The textbook has been typeset and is in the bookstore. The 370 version of the compiler is complete, but largely untested. Three thousand University of Toronto students begin using the language on four VAX machines and the IBM 3033.

I learn that courses other than introductory programming have adopted the new language. The course on data structures is using Turing's modules, dynamic arrays, pointers and union types and finding them superior to data structuring features in PL/I and Pascal.

In November, Bill Buxton announces that Turing is so much easier to teach than PL/I that he is two weeks ahead of his teaching schedule.

**Lecture at IBM.** Some of us at the university are invited to give lectures to the Toronto IBM laboratory, which does compiler work. In my lecture, I explain how the Turing compiler was developed. The question I get is: What are the management protocols for approving this sort of development project at the university?

I am confused by the question and reply: "I guess we do not have any management protocols." The questioner says for him, gaining approval for a project of this magnitude, involving the creation of a language with compilers and user documentation, would consume more resources than the university consumed on the entire Turing project. It occurs to me that the Turing people (language designers, compiler implementors, book writers and formal definers) have been eating, breathing and sleeping the language for a year.

We feel we have a better language and a better compiler, but we wonder: Is the world ready for it? We are encouraged when our publisher begins producing Turing T-shirts to promote the book. The Toronto newspaper picks up the story; this leads to a radio interview on Turing, which leads to more media coverage.

We carefully package the VAX compiler for external distribution and begin development of a Turing compiler for IBM Personal Computer compatibles, scheduled for completion this month. We start working on an interpretive Turing programming environment for home computers.

Maybe the world is ready for a better language. We think so, and just in case, we are making Turing ready for the world.

### About the author

*Richard C. Holt is a professor and chairman of the Computer Systems Research Group at the University of Toronto. He has been on the design and implementation teams for widely used software, including PL/C, the SUE System Language, SP/k, CSP/k and Concurrent Euclid.*

*Holt's research on operating systems includes formalization of the deadlock problem, development of a Unix-compatible system called Tunis and development of the Turing system.*

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# IN DEPTH



## Cobol, your age is showing

By Richard L. Conner

Happy silver anniversary, Cobol!

May 1984 marks Cobol's 25th birthday. It was on May 28-29, 1959, that the fateful decision was made to embark on the Cobol project. Thus was the DP world transformed.

It is appropriate to mark the occasion with an assessment of Cobol's influence. Cobol's net influence on data processing progress has been negative; it has impeded more than it has helped. Some useful features of Cobol have turned up in other languages, but Cobol has never risen above its initial shortcomings.

Although we think of Cobol as a language, this discussion will view it as something more — a mentality, if you will. Linguists will tell you that language is no small determinant of culture. It is not improbable that the Chinese civilization, with more than 3,000 years of written language behind it, never developed any mathematics beyond the most elementary level in part because it was never widely perceived in China that numbers can be nouns as well as adjectives.

There can be little doubt that Cobol is pervasive. It is plausible that half the computer instructions executed in the world today started out as Cobol statements.

As you look over your company's program library, you'll likely agree that at least half the lines of code in it are written in Cobol.

Much has been written about Cobol. The San Francisco Public Library's card catalog has four

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*The story of Cobol bears an eerie resemblance to many a DP project. The groundwork was laid down under tremendous pressure from a powerful user; time pressure and conflicting priorities further hampered the design job. Compromises were made that in the end proved to be both short-sighted and crippling.*

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## IN DEPTH/COBOL'S 25TH BIRTHDAY

centimeters of cards filed under "Cobol." There has probably been more pedagogical energy expended on Cobol than on any other programming language.

### Early history

Cobol is older than many of its users. Perhaps fittingly, the decision to create Cobol was made at the Pentagon, home of other far-reaching decisions. In 1959, Fortran was an infant, but a prodigious one. Computer users — a large proportion of them in science, engineering and academia — were enthusiastic about Fortran.

It wasn't only that Fortran was easy to learn and use. The original compiler embodied sophisticated parsing and optimization techniques that look good today. Its very existence showed that effective languages and compilers could be developed.

As a good idea will, Fortran stimulated a rash of creative efforts. Languages and compilers for them sprang up like weeds. It was an era that prompted the *Communications of the Association for Computing Machinery* to feature the Tower of Babel on its cover.

People began to worry. They worried that programmers would have to be polyglots. They worried about languages locked to particular machines — and to particular machine manufacturers.

### Biggest worrier

One of the biggest worriers was the U.S. Department of Defense (DOD). It had computers; it planned to get more; and it planned to scatter them around the globe. Its procurement practices encouraged competitive bidding and multiple suppliers.

The DOD planned to install uniform accounting systems. It had discovered the economies of putting the same color shoes and the same kind of T-shirt on all its troops, and it wanted to extend the idea to its computer programs. It wanted to write the programs for each application only once, then ship the application to all of its installations for local use.

Of course, with the variety of architectures prevailing, a hardware-independent language was needed. And, although Fortran compilers had been or soon would be developed by some defense suppliers, Fortran just wouldn't do for many of the DOD's applications. In particular, Fortran did not seem amenable to alphabetic fields, data structures or common operations like sorting, merging and reporting. Fortran wouldn't do, but applying the compiler idea to the DOD's needs seemed worth investigating.

Even in 1959, the DOD was a big spender. When it talked, suppliers listened. The department had clout, and it was willing to use it. When it announced that soldiers, sailors, marines and fliers would all wear black shoes, the suppliers didn't argue. They all ordered black dye.

Besides, there was a major recession going on. The federal government, in our Keynesian era, could be looked upon as a market segment that would not shrink and could even expand.

The DOD found willing allies among the computer manufacturers. They realized that, without something like Cobol, a single manufacturer stood a good chance of getting all or most of the marbles. Once one

of them got a CPU installed with a DOD application running on it, that manufacturer would be able to sell a lot more hardware to DOD for the application in its scattered DP installations.

And the camel's nose would be in the tent. Not only would the lucky winner be in a good position to expand the installations as new applications came up, the huge costs of conversion to another architecture would preclude a competitor from getting a bite at the apple when hardware replacement time came around.

It made sense, then, for manufacturers to support Cobol. It left open the chance to get a piece of the action initially and to try for replacement business if the first pitch got no sale.

In the marketplace at large, Cobol looked appealing. It reduced risks — the risk of developing a language and compiler that would flop and the risks of scattering resources to develop and maintain a stable of compilers. It reduced parasitic risk, the risk that a language originator's forces would be dissipated attempting to keep up with dialects and extensions created by competitors.

### Action begins

So the meeting of May 28-29, 1959, came about, called by the DOD. Attending were representatives of the U.S. government, computer manufacturers and major business users of computers. It was decided to go ahead with Cobol.

Committees were formed; one of them (the Short-Range Committee)

assumed the task of defining the language. It did, and what the committee came up with looks very familiar to today's Cobol user.

By any measure, the language definers made a stupendous effort. They did their job in six months. There were nine people involved, of whom six did most of the work. They worked part-time, having other commitments to their employers. They were bright, able and opinionated people, so initial unanimity on many ideas was unlikely.

Agreement had to be forged in discussion and debate. They finished their report on Nov. 20, 1959. The Government Printing Office printed it the following April. Some revisions ensued, resulting in Cobol-1961, but the revisions did not touch the core of the language definition or its

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EJECT PAGE AFTER SUBTOTALS? (Y/N) N
ENTER SUBTOTAL HEADING: CHARGES FOR ACCOUNT
COL      WIDTH,CONTENTS
001      9,ACCTNUM
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002      20,DESC
ENTER HEADING: DESCRIPTION
003      8,AMOUNT
ENTER HEADING: AMOUNT
ARE TOTALS REQUIRED? (Y/N) Y
004      10,BALANCE
ENTER HEADING: BALANCE
ARE TOTALS REQUIRED? (Y/N) N
005
```



## IN DEPTH/COBOL'S 25TH BIRTHDAY

underlying philosophy and framework.

The initial definition and early development of Cobol suffered from now familiar shortcomings in direction and communication. The Short-Range Committee understood its task to be the creation of a stopgap, good for a year or two.

It was to be the job of an Intermediate-Range Committee to come up with a refined product. It is not clear what the planned Long-Range Committee was to do; it was never formed.

Somehow, after the Short-Range Committee did its job, the plan eroded. The Intermediate-Range Committee never got around to its mission. So compromises, gaps and expedients that were thought necessary to get a temporary product out the door re-

*Cobol shows its origins. It is a language designed by a committee. In retrospect, the Cobol designers and their sponsors can be faulted for some of the same mistakes that still afflict DP. The user was exigent; the DOD imposed a very tight schedule.*

main in Cobol even now. Settled expectations have grown up around them. Undesirable as they may be, they are so bound up with the language that it's unlikely they can be excised.

Cobol shows its origins. It is a language designed by a committee. In retrospect, the Cobol designers and their sponsors can be faulted for some of the same mistakes that still afflict DP.

The user was exigent; the DOD imposed a very tight schedule. The Short-Range Committee was induced to engage in short-range thinking. It imposed contemporary technology on its product, which placed a mortgage on the future.

The committee let politics unduly influence its deliberations. Two sources of ideas were Remington Rand's Flow-Matic and IBM's Commercial Translator.

According to committee member Jean Sammet, the committee refused to incorporate good ideas that it recognized in Commercial Translator because it didn't want to create the appearance that IBM had dominated the discussions.

#### Technological constraints

It is true that extant technology imposed constraints. Compiler theory was in its infancy. The total installed computing capacity in the U.S. was probably less than 100 million instructions per second. Giant computers had main storage of less than 100K bytes.

Auxiliary storage would be needed for compilation, but auxiliary storage had pronounced limits. Cheap direct-access devices were unknown, and those in use had transmission rates that were a small fraction of those prevailing now. Tape was the principal on-line auxiliary storage medium, and tape performance was primitive by today's standards.

High density on IBM tapes was 556 char./in.; the tape transfer rate was less than 64K byte/sec. Channels were still rare. When I/O occurred, the CPU either waited or spent all its time controlling the I/O.

And the CPU took its time. IBM's 7090, which cost as much as an airliner, pushed data around more slowly in 1959 than its PCjr does in 1984.

#### Compilation speed

In the face of such hardware limits, compilation speed was of vital concern. If it took hours — and it often did — to assemble a 7070 Autocoder program of a few hundred statements, who knew how long a compilation of a program written in a free-form language would take? And while compiling, the computer could do nothing else: Multiprocessing was yet to come.

Other spectres loomed. There was the spectre of computers spending the vast bulk of their time compiling — reducing the effective instruction rate for actually solving the problems of a business to hundreds or even tens of instructions per second. The transistor was young: Magnetic recording technology had not made its great strides.

If compilation time approached mean time between failures, it became a real possibility that the Cobol shop would accomplish nothing at all, spending all of its hardware resources trying to compile.

Furthermore, a payroll program for 10,000 employees isn't a thousand times bigger than one that pays 10. Compilation of even the simplest program could take many times the resources needed to run the application itself. Slow compilation coupled with batch turnaround times could inflate development costs and postpone time to payout.

#### Technology Dependence

As a result of concern with compilation performance, the Cobol language, while touted as machine-independent, suffers from technology dependency.

And the technology is that of the DP Dark Ages. It is not hard to imagine that the committee, haunted by visions of tapes spinning (and rewinding while everything waited), labored to minimize compiler tape passes by constraining the language.

The three principal problems that the Cobol definers attacked were

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*Cobol was born flawed. The state of the art at its birth, however, was such that some of the flaws were unrecognizable. Yet to come were Iverson's powerful work with functions and the series of efforts exploring structured programming.*

portability, maintenance and productivity. Cobol may have had some success with portability, but the value of its impact on the other two is questionable. The user community probably gravitated toward Cobol because of its concern with maintenance and productivity.

The committee's view of maintenance can be expressed in its own words:

"With the rapidly changing and expanding require-

ments of management, data processing systems need constant revision and augmentation. Full documentation of the present system is required in a form conducive to making such changes with minimum time and costs."

Thus "[a] Common Business Oriented Language, . . . open-ended and stated in English, would do much to solve or reduce this problem." In 1969, Jean Sammet wrote: "The readability of

Cobol programs would provide documentation to all who might wish to examine the programs, including supervisory or management personnel."

Today, programming managers tear their hair when the subject of documentation of Cobol programs comes up. Maintainers of Cobol programs constantly complain that the code is incomprehensible.

This is not to say the same problems don't exist with other languages; it is to say that it was vain to hope that the problems could be relieved by anything so simple-minded as an English-like language. Adopting the English language won't create a race of Shakespeares and Hemingways or even a race of writers of clear prose. Something else is required.

#### Unrecognizable flaws

Cobol was born flawed. The state of the art at its birth, however, was such that some of the flaws were unrecognizable. Yet to come were Ken Iverson's powerful work with functions and the series of efforts exploring structured programming. And, of course, there was no experience with anything comparable to Cobol. But with the progress of computing, the subsequent Cobol story was one of comparative stasis, as events overtook the language.

What happened — and what didn't happen — to Cobol in the first decade of its existence may be explained under the heading of "management failure."

Cobol's sponsors dropped the longer range project that was to follow the initial effort. They lost sight of the original one- to two-year tentative lifetime of the language. As weaknesses began to be noticed, patches were applied.

Regarding Cobol, technology transfer seemed to move one way, flowing out of the language but not into it. Some powerful Cobol features found their way into other languages, features like pictures, enumerated data types, variant records and hierarchical record structures.

Yet useful features that showed up in other languages took a long time to get into Cobol or haven't gotten into it yet. Among those features are parametric procedures, the case construct, string operators and functions.

#### Cobol is anti-English

Cobol can be called "English-like" only with considerable stretching of one's idea of English. For example, consider reserved words. They doubtless originated because of the time pressures and technological limits the committee encountered. It's easier to write a

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compiler in which the keyword "author," for example, is restricted to a defined context than it is to write one that permits: "Sort acquisitions ascending on surname of author. . ."

Reserved words were probably an expedient adopted because the language was changing even as it was being defined. Reservation of keywords permits an arbitrarily large number of syntactical units, allowing play in the joints of statement definition.

#### Reserved words

There are now more than 300 reserved words in the Cobol language. There shouldn't be any. English has none; PL/I has none; Cobol's elder cousin, Fortran, has none. Many of the reserved words foreclose the programmer's choice of appropriate self-documenting names.

The Short-Range Committee is not responsible for the definition of all of today's Cobol reserved words. In 1959, Cobol had fewer of them than it has now. Some have been dropped; more have been added. The accretion over the years should be a warning.

Once you allow reserved words into a language, you tend to be locked in. If you later take them out, you impair portability; your new program can be rejected by your older, otherwise satisfactory compiler. And, as the recent furor over reserved words shows, if you add new ones, you inhibit moving your old programs to your new compiler.

#### The 1959 list

Although objectionable in principle, the 1959 list of reserved words presented less of a problem than the 1984 list. As the language has grown, the list has grown. The list is compiled from the list of required (and optional) words in defined Cobol statements.

The selection now appears perverse. An example that comes to mind immediately is that "day" and "day-of-week" are reserved words, while "year," "month" and for that matter, "day-of-month" are not.

The large list of reserved words and the fact that one needs to be conversant with the entire Cobol language to guess intelligently whether a proposed data name is reserved have helped lead Cobol writers into gibberish. Partly to avoid compilation errors from illegal use of reserved words, they have developed rules of thumb, one of the most pernicious of which is to include (often at the worst place, the beginning) in all data names some string of characters that form no English word. The result has been the injection of large amounts of noise

into Cobol programs.

The noise isn't harmless. Any time we encounter non-English embedded in what purports to be English, we hesitate. Many of us hear the words in our heads as we read them; some people's lips move as they read. When the reader encounters non-English, he's likely to be brought up short. It's distracting; it interrupts thought. It requires determining whether the writer

was using an artifice to get around the reserved words barrier or was trying to distinguish fields.

Perhaps worst of all, Cobol's built-in encouragement of non-English demands that the reader or writer substantially increase his vocabulary every time he wades into a Cobol program. The additional vocabulary is largely ad hoc, good for this day and train only. Because it is neither language-depen-

*What happened — and what didn't happen — to Cobol in its first decade may be explained under the heading of "management failure." Cobol's sponsors dropped the longer range project that was to follow the initial effort.*



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dent nor application-dependent, no systematic rules for its decipherment exist.

True, there are other reasons why the goal of "meaningful data names" remains elusive, but the reserved word bind has done its part. Reserved words are fundamentally incompatible with "an open-ended, English-like" programming language. Imposing them is like permitting Mozart to compose in any key except G minor.

Reserved words shouldn't be in Cobol, but they are. Two other features should be in Cobol but are not. They are parametric procedures and functions.

It is a close case whether the idea of algorithmic functions, as opposed to mathematical functions, was well-enough advanced to have attracted the committee's attention.

Fortran had built-in functions, including the commer-

cially useful MAX, but Fortran's functions were generally well-recognized mathematical ones that appeared to be of little value to Cobol users.

However, Fortran contained the germ of the larger idea of function. It permitted the user-defined function, the meaning of which was determined by the programmer.

Related to functions are parametric procedures. If a

parametric procedure returns one value per execution, it may be viewed as a function that produces a set or a structure.

Viewed this way, the idea of parametric procedure can be assimilated into that of function. Commercial Translator had parametric procedures and user-defined functions, but the ideas weren't carried over to Cobol.

Thus Cobol ended up without a feature that has

proved of immense value. As Ken Iverson was to show in the early '60s, it is possible to define a coherent, powerful programming language, usable by nonprogrammers, in which the only notation for operations on data is functional notation. Structured programming, too, uses the idea of function.

Two unfortunate conse-

*Often, Cobol training has been treated as programming training; if the idea isn't expressible as an elementary Cobol construct, the idea isn't explored.*

quences followed from Cobol's lack of functions. One consequence was programs larger than they needed to be. In many contexts, a function or a parametric procedure is more desirable than a CALLED subroutine. The modulus function is an example. Documentation and cross-references are easier, simplifying the job of the maintainer.

In those contexts, however, the Cobol programmer is faced with choosing among an external subroutine; multiple inclusion of the necessary code, with different variable names; or internal linkage via communications variables.

All three options impose documentation and maintenance burdens. In addition, communications variables aggravate the ad hoc vocabulary problem.

Furthermore, and quite likely more important, the absence of functions in Cobol has stood in the way of getting programmers to think in terms of functions. Often, Cobol training has been treated as programming training; if the idea isn't expressible as an elementary Cobol construct, the idea isn't explored.

Many Cobol programmers have been left to arrive at the root ideas of function on their own.

Productivity was the committee's third concern. Again, to quote the committee report:

"Many users are faced with the need to produce a larger number of computer programs in a short period of time. This places a heavy burden on the existing programming staff or requires quick augmentation with relatively inexperienced programmers."

And again, Jean Sammet said: "One [kind of Cobol user] is the relatively inexperienced programmer . . . Little attempt was made to cater to the professional programmer; in fact, people whose main interest is

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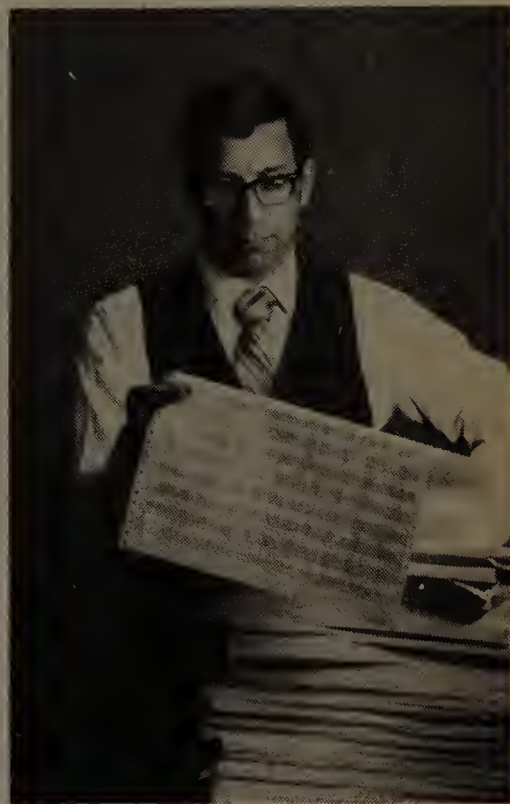
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## IN DEPTH/COBOL'S 25TH BIRTHDAY



*Unfortunately, what was lost sight of in the rush was that there is a difference between understanding computers and understanding computing. Cobol may free one from the annoyance of dealing with the peculiarities of a particular machine, but the need for other programming skills remains.*

programming tend to be very unhappy with Cobol . . ."

The resulting design objective of Cobol has allied itself with vigorous marketing by DP equipment suppliers and uncritical acceptance by users to help create a whole generation of people who are called programmers but whose numbers include many who are handicapped by functional DP illiteracy.

There are other reasons, involving linguistics, culture and technology. Enormous improvements in CPU power have made it easy to get a program to work. One can compile a source program of thousands of records in minutes; in many shops, CPU horsepower and on-line editors enable one to get a half-dozen big compilations and tests run before lunch. In such an environment, tinkering until it works is easy, and quality control is tough.

Sammet tells us that people whose main interest is programming tend to be very unhappy with Cobol. She attributes the unhappiness to Cobol's verbosity. I offer a hypothesis that supplements or expands her explanation. Cobol stultifies thought. The large number of words required, the clerical overload and the inconsistencies and annoying peculiarities of the language combine to get in the way of solving the programming problem at hand.

#### Pedagogical nightmare

So much is needed just to get started. As DP teachers have learned to their despair and frustration, Cobol is a pedagogical nightmare. I've been successful at teaching groups ranging from seventh-graders to senior executives of the Fortune 100 about computing. I've gotten these students, previously innocent of electronic computing, to write and run programs in Fortran or assembly language by the end of the first class day. It would take much longer to achieve a like result with Cobol, and the time of these people is too valuable for that.

Whenever I explored the possibility of using Cobol as an introductory vehicle, the students were repelled by the unnecessary and seemingly arbitrary complications of the language.

They were perceptive enough to realize that programs are read by computers, rarely by people. (The typical program is hardly ever read by anyone, even by its author; at most it is referred to. The language used should be like that found in works of reference — procedure manuals, almanacs, atlases — compact and easy to cross-reference.)

#### Ensured its rise

Despite Cobol's linguistic difficulties, the perceived needs of American business and the manufacturer-encouraged lack of interest in a successor ensured its rise to prominence.

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Managers bought it. Collective managerial madness is sadly not a rare thing. During the quarter century of its affair with Cobol, for example, American industry has seen the attempted suicide of its domestic automobile, steel and consumer electronics segments. By itself, the widespread use of Cobol is no proof that it is a good thing. Test the proposition by substituting "tobacco" for "Cobol."

What was lost sight of in the rush was that there is a difference between understanding computers and understanding computing. Cobol may free one from the annoyance of dealing with the peculiarities of a particular machine. (Then again, it may not; courses are advertised and books published with titles like "Dump Reading for the Cobol Programmer.")

But the need for other programming skills remains: trained analytical powers, ability in rigorous logical thinking, a refined appreciation of elegance, a sense of craftsmanship, business judgment and intellectual curiosity.

#### Stopped too soon

We were deluded into stopping too soon. Management was deluded into thinking that if you have someone who can write a collection of Cobol statements that produces the desired output, you have a programmer. Vendors and operators of Cobol academies did nothing to disabuse management of that notion.

The trainee, after having sweated through a Cobol course, would justifiably feel that programming is some kind of black art. And, having spent so much effort in learning a great many complicated rules for writing Cobol statements and mastering the circumlocution necessary to program conceptually easy processes, that trainee might with some justification conclude that he'd learned it all.

We got it backwards. We failed to recognize that mastering another programming language is duck soup for someone who understands programming. So we taught a generation to write Cobol statements, and we left to chance the education of that

generation in programming.

#### Training costs

We worried about training and retraining costs. If we could hire somebody off the street who spelt "Cobol" with at most one "A," we felt we'd filled a programming slot. Training costs, while real, are probably overestimated. Given a supply of manuals and sandwiches, anybody who's worth his salt in the DP business can

become productive in a new programming language over a weekend.

Even Cobol's idiosyncrasies present only irritations, not real obstacles. If that is true, then our recruiting and training practices have been wrong. Instead of viewing our programmers as interchangeable black boxes, any one of them easily replaced by another bearing the label "Cobol," we should have been nourishing sound DP

*We got it backwards. We failed to recognize that mastering another programming language is duck soup for someone who understands programming. So we taught a generation to write Cobol statements, and we left to chance the education of that generation in programming.*



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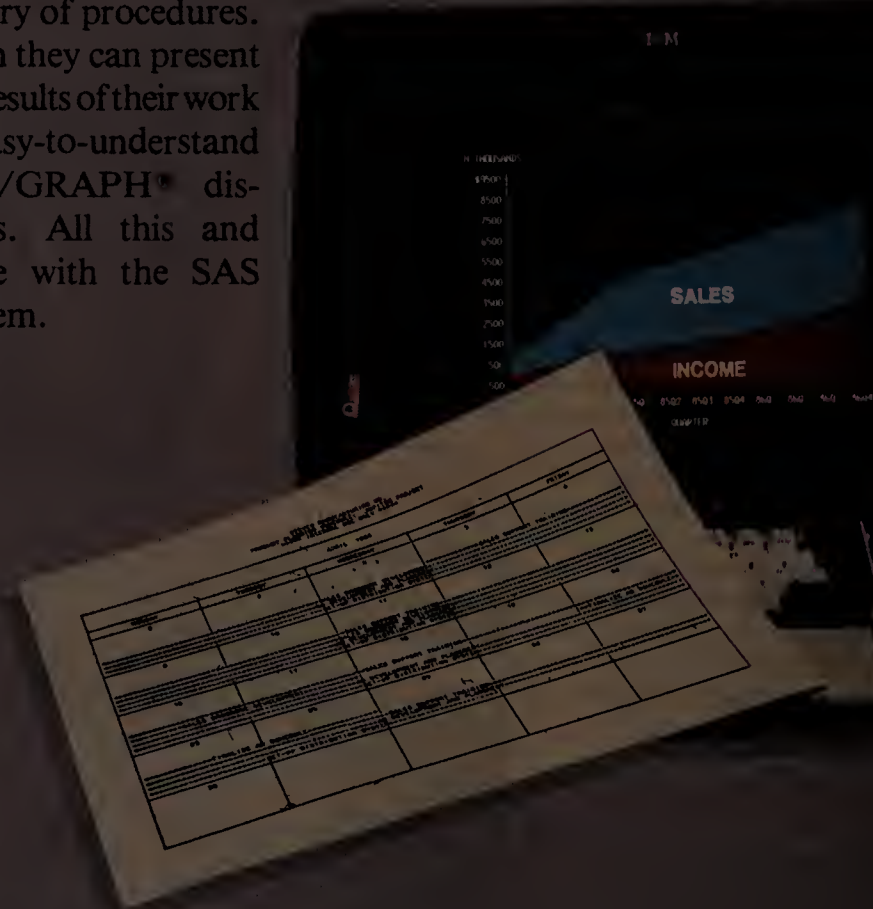
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April 9, 1984

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Basic Security Number: 342 33 345  
Name: Margaret Wells  
Address: 400 Park Drive  
City: San Jose, CA 95126  
Phone: 555-1234

Emergency Contact:  
Name: Mr. R. W. Wells  
Address: 205 Trail in the Pines  
City: Wilmington, NC 28402  
Phone: 919-333-1234

Signature: *Margaret Wells*  
Typed Name: Margaret Wells  
Typed Address: 400 Park Drive, San Jose, CA 95126

Command (F00) SAS/GRAPH: EMP INFO

Employee Information

Employee Number: 109649  
Employee Name: Ms. Margaret Wells  
Department: Marketing Local on: Blvd A Unit: 4945  
Birthdate: 04SEP57 Sex: F Marital Status: S  
Number of Dependents: 0 Social Security Number: 242 23 3943

Home address: Apartment D  
4905 Duna Drive  
San Jose, CA 95126  
Home phone: 555 7634

Work phone: N/A

Information about Employee's Spouse:  
Spouse's Name: N/A  
Spouse's Exp. over: N/A  
Work Phone: N/A

For an emergency, please call:  
Mr. or Mrs. R. W. Wells  
205 Trail in the Pines  
Wilmington, NC 28402  
919-333-1234

Emergency Contact:  
Name: Mr. or Mrs. R. W. Wells  
Address: 205 Trail in the Pines  
City: Wilmington, NC 28402  
Phone: 919-333-1234

Emergency Contact:  
Name: Mr. or Mrs. R. W. Wells  
Address: 205 Trail in the Pines  
City: Wilmington, NC 28402  
Phone: 919-333-1234

Statement: Manufacturing Company  
of Financial Statements: 1983

Account	1983	1982	1981	1980	1979
Assets					
Current Assets	1,200,000.00	1,100,000.00	1,000,000.00	900,000.00	800,000.00
Fixed Assets	500,000.00	450,000.00	400,000.00	350,000.00	300,000.00
Total Assets	1,700,000.00	1,550,000.00	1,400,000.00	1,250,000.00	1,100,000.00
Liabilities					
Current Liabilities	800,000.00	750,000.00	700,000.00	650,000.00	600,000.00
Long-Term Liabilities	300,000.00	250,000.00	200,000.00	150,000.00	100,000.00
Total Liabilities	1,100,000.00	1,000,000.00	900,000.00	800,000.00	700,000.00
Equity					
Common Stock	500,000.00	500,000.00	500,000.00	500,000.00	500,000.00
Retained Earnings	1,000,000.00	900,000.00	800,000.00	700,000.00	600,000.00
Total Equity	1,500,000.00	1,400,000.00	1,300,000.00	1,200,000.00	1,100,000.00
Total Liabilities & Equity	1,700,000.00	1,550,000.00	1,400,000.00	1,250,000.00	1,100,000.00



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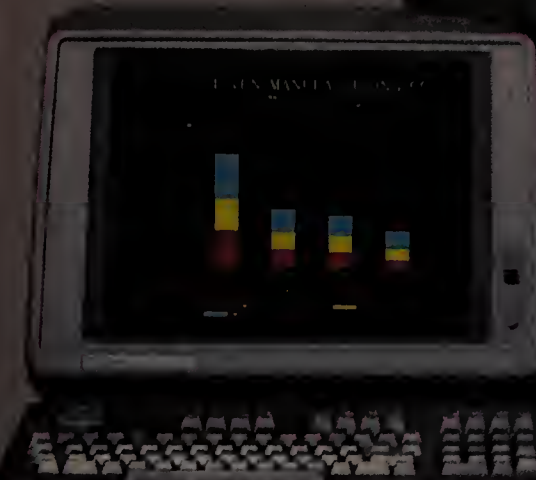
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VAX SYSTEM USAGE BY DEPARTMENT  
FOR APRIL 9, 1984

DEPARTMENT	JOBNAME	CPU MINUTE		I/O COUNT	
		NUMBER OF EXECUTIONS	SUM	MEAN	SUM
ACCOUNTING	JACCT110	3	51.32	10.44	11372
	JACCT210	7	16.97	5.57	34964
	JACCT220	9	103.95	12.99	74237
	OTHER9	25	113.74	4.55	34085
HUMAN RESOURCES	OTHER9	18	31.00	1.72	50374
LEGAL	OTHER9	14	17.00	1.06	8219
MARKETING	JMKT010	3	31.85	10.45	12557
	JMKT020	9	165.36	18.15	159131
	JMKT015	9	92.33	10.29	41748
	JMKT020	1	97.01	9.57	132357
	OTHERS	21	89.95	4.28	100880
PLANNING	OTHERS	17	43.00	2.53	27479
PRODUCTION	JPROD000	12	80.47	6.71	107271
	JPROD050	7	170.00	24.29	89020
	JPROD060	4	59.35	14.59	91561
	OTHER9	24	142.19	5.92	108352
SYSTEMS	JSTY025	4	16.47	9.92	22519
	JSTY030	4	24.62	6.15	39212
	JSTY000	4	47.34	11.84	41790
	JSTY050	4	69.67	12.42	40254
	OTHERS	17	33.84	1.99	114291
ALL JOBS		229	1440.00	6.49	1344409

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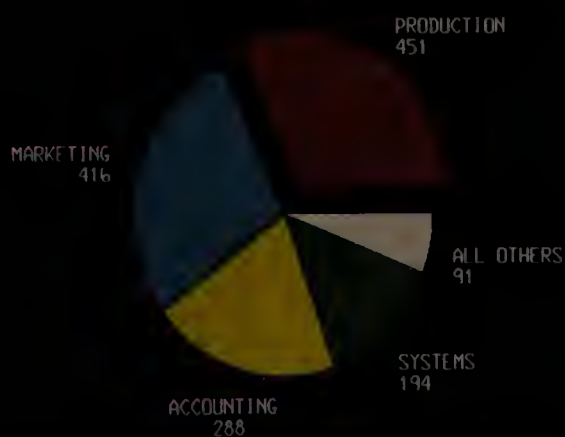
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## IN DEPTH/COBOL'S 25TH BIRTHDAY

*At a time when industry is complaining of the programming crunch, when demands are heard for more and better programs to help the country become more productive, what are some of its most celebrated programming brains doing? They're creating video games and becoming millionaires at it. And those video games aren't written in Cobol.*

skills and keeping in mind that conversance with any particular programming language is a very small part of a rational job description for a programmer.

The mentality I've sketched has imposed costs. Two of the finest productivity-enhancing features of Cobol never really got off the ground. The DEFINE facility was specified in 1959 to permit a macro-like capability.

As with Fortran and PL/I's user-defined functions, it allowed the user to create new verbs for his applications. It started out as an optional feature. It was removed entirely in the mid-'60s because nobody had implemented it.

The report writer feature languishes. But I've directed more than one project in which I insisted that it be used in appropriate circumstances. After initial resistance from people who had been writing Cobol for years without using the report writer, the results have been uniformly favorable.

Subjectively and objectively, the invariable conclusion of those to whom I've introduced the report writer has been that it is a valuable aid to productivity, especially in view of the amount of printing that marks many installations and the necessity for frequent revision of report layouts and contents.

### Cobol mind-set

I suggest that the desuetude of DEFINE and the report writer stem from the Cobol mind-set. Cobol eased the process of getting out a program that runs to end of job. We let that entice us into believing that it entirely simplifies the process of creating supple and maintainable programs. I suggest that these two productivity features didn't catch on because we let Cobol's relief from the nitty-gritty lessen our appreciation that programmers need to understand what a function is and that they need to understand the structure of a report.

If people "whose main interest is programming tend to be very unhappy with Cobol," shouldn't red flags wave before a programming manager's eyes and Klaxons go off in his ears? What other kind of people do we want writing the programs that help keep the firm going?

A recent phenomenon is instructive. At a time when American industry is complaining of the programming crunch, when demands are heard for more and better programs to help the country become more productive, what are some of its most celebrated programming brains doing? They're creating video games and becoming millionaires at it. And those video games aren't written in Cobol.

Take another phenomenon. While DP managers wring their hands about training costs and recruitment problems that would result from moving beyond Cobol, many of their staffs are playing with personal computers in the evenings — and train-

ing themselves in Basic and assembler language.

The users, for their part, are bypassing the whole mess by exploiting nonprocedural languages on micros at their desks.

### Eerie resemblance

In sum, the story of Cobol bears an eerie resemblance to many a DP project. The groundwork — the basic system design — was laid down under tremendous pressure from a powerful user; time pressure and conflicting priorities further hampered the design job. Compromises were made — compromises perceived to be required by existing technology, but compromises that in the end proved shortsighted and crippling.

During its lifetime, Cobol has been asked to do many things that were not in the minds of its definers, who didn't appreciate a basic fact of DP life: Every system will be asked to do more than it was designed to do. Because of the constraints its implementers were discouraged from going beyond, Cobol has failed to become the flexible and adaptable instrument demanded in our world of rapid technological change and continuous business innovation.

Like the creaky old accounting subsystem known to every installation, it's been tinkered with and augmented piecemeal too often, when the wiser course would have been to acknowledge its practical limits and to build foreign interfaces instead.

### Beginning of the end

Although you've stood in the way of data processing progress for 25 years, Cobol, you've only been able to delay it, not halt it entirely. We've begun to see the light. We've begun to see that if we train an army of people to write Cobol statements — and little else — we'll get output much like that of the proverbial 10,000 baboons bashing away at their word processors: nonsense produced at lightning speed, but nonsense nevertheless.

We've begun to learn that although it may be comparatively easy to teach our employees to write Cobol, it is not necessarily wise to ask them to.

So, Cobol, on your 25th birthday, I commend you for having survived so long, but I don't wish you "many happy returns."

In the DP world, a quarter of a century is a long time. You're showing your age, and I wish you an early retirement and a painless demise.

### About the author

Richard L. Conner is a San Francisco-based consultant specializing in software and management consulting. He has extensive DP experience in the U.S. and abroad, including nine years with IBM. Conner is a member of the Commercial Arbitration Panel of the American Arbitration Association.



# IN DEPTH



## Don't rush to court when your system fails

By Richard Raysman  
and Peter Brown

A few years ago, a large international bank decided to install an automated securities processing system. The bank had a large and capable in-house data processing staff but decided that it needed an automated system in a short period of time to remain competitive.

It contracted with a computer software company that already had securities processing systems in operation at other locations. The software company claimed that it could modify its software for the bank's needs and install a sophisticated system within four months.

Two years later, the bank was still testing the system. It was not in operation as a result of severe problems: Response time at the terminals sometimes took more than one minute, and the bank needed twice as many machines to operate than anticipated.

Some of the bank's data processing staff wanted to scrap the entire system and buy a new one. The data processing manager suggested suing the computer vendor for a refund,

---

***To develop a negotiating strategy, the user must study the contract, especially with regard to the vendor's performance obligations. Often the agreement is vague and the performance requirements either ambiguous or undefined.***

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## IN DEPTH/DON'T RUSH TO COURT

*When the service bureau heard of the proposed changeover to an in-house system, the cooperative relationship with the insurance company quickly degenerated, and the service bureau no longer delivered the critical monthly tapes.*

which would be used in paying for a new system. In the meantime, bank personnel involved with securities processing insisted that a computerized system was needed immediately.

Rather than discard the system and enter into a lawsuit, the executive vice-president in charge of MIS decided to start negotiations with the vendor. He was an experienced negotiator who relied on his technical staff for

advice. His staff suggested a way to complete the system adequately for the existing hardware and then upgrade it to more powerful hardware.

The software vendor was not happy with this solution, since it required him to do much additional work to complete the system and allowed the bank to eventually use different hardware without additional compensation to the vendor. Nevertheless,

after careful negotiations the bank obtained a commitment for a fully operational securities processing system without having to resort to litigation.

#### Company survival

The case just described involved a computer system that was beneficial but not critical to the company's continued operation. Sometimes a computer-related dispute so threatens a business that careful negotiations are crucial to the company's survival.

For example, when a small insurance company decided to computerize its record-keeping system, its volume of life and property policies could not justify a large and expensive data processing installation.

Management determined that it could rely on a service bureau for this volume of work. The service bureau used its own computers and programs to process the policies, doing billing and claims on a batch basis. It agreed to provide the insurance company with monthly data tapes containing the most current information in its files.

For several years, the insurance company found this arrangement satisfactory. But eventually the limitations of the batch processing system, including lack of immediate access to policy information, together with the rapidly decreasing cost of hardware, led the company to decide to install an in-house computer system.

#### Quality deteriorated

When the service bureau heard of the proposed changeover to an in-house system, the cooperative relationship with the insurance company quickly degenerated, and the bureau no longer delivered the critical monthly tapes. The quality of service deteriorated, and the bureau began to bill for services that it had previously provided at no additional cost.

The insurance company realized that without the service bureau's cooperation, conversion of existing policyholder files would be time consuming and expensive. Conversion of data alone would cost several hundred thousand dollars, and any sudden break in relationships with the bureau could have a devastating effect on its business.

Although litigation was considered, the president of the insurance company decided that negotiations would be more sensible, given the company's needs and the cost of conversion to an in-house system. As a result of lengthy and complex negotiations, the service bureau received additional compensation while agreeing to cooperate with the data

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## IN DEPTH/DON'T RUSH TO COURT

*Rather than accuse the vendor at the outset of a disagreement, dissatisfied users that follow a structured approach to negotiations may be able to resolve the conflict. A structured approach aims at maintaining the business relationship with the vendor while meeting the legitimate complaints of the user.*

conversion. Preservation of the relationship enabled the insurance company to meet its long-term data processing requirements and to avoid litigation.

#### Structured negotiating

As any executive involved with the purchase of computer services knows, users are frequently disappointed in the performance of their computer installations, sometimes to the point of

desperation. After spending a great deal of time, effort and money on a complex system only to find it marginally operational, a computer user often wants to throw out the system and either absorb the loss or sue the vendor.

Unfortunately, even a successful suit does not meet the original need to improve productivity by computerizing important business functions.

In most cases, such as that of the small insurance company, the user of computer services and the vendor have a strong service relationship, amounting sometimes to complete dependence.

Rather than accuse the vendor at the outset of a disagreement, dissatisfied users that follow a structured approach to negotiations may be able to resolve the conflict.

A structured approach aims at maintaining the business relationship with the vendor while meeting the user's legitimate complaints. By negotiating a resolution, the user still can use the computer system while the vendor works out necessary improvements or upgrades it. And, of course, the user saves legal expenses and preserves its investment.

Both local distributors and major national companies in the computer industry rely on good service relationships with their customers. Most vendors, if pressed, will respond to legitimate complaints. Since computer hardware and software are constantly evolving, the loss that a vendor may suffer in resolving a problem may be recouped in a future sale. To develop an effective negotiating strategy, the user management should consider the following seven steps.

**Step 1: Seek expert assistance.** Any type of negotiation involving performance and finances is delicate, and technical and industry knowledge are key elements. The responsible executive (for example, the president, chief financial officer or director of MIS) for the user organization should rely as much as possible on in-house technical staff, who are likely to be familiar with the company's data processing functions and with the data processing industry as a whole. If no insider has this knowledge, the company can retain independent technical consultants to advise whether requests are reasonable and to clarify technical requirements as well as industry practices and standards.

**Step 2: Define the issues.** Too often a user, frustrated over the disappointments of a failed installation, has neglected to take a close look at the problem. For example, the data processing staff at the bank was at first able only to repeat its expression of continued anger at being unable to speed up the securities processing procedures.

The less immediate but equally significant issues involved slow administrative procedures, inaccurate administrative reports and undelivered software enhancements. Only after meeting with the responsible executive and conducting staff meetings could the data processing staff define these



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## IN DEPTH/DON'T RUSH TO COURT

*If drafted with the assistance of a person knowledgeable about the data processing industry, a detailed demand defines the hard issues between the user and the vendor. It is astounding how often users and vendors engage in acrimonious disputes without clarifying these problems.*

issues for presentation by the negotiators.

The user should review the entire computer system and compare it with the vendor's initial representations. Frequently, users find that functions that were not identified as necessary for the installation prove to be very important. The data processing staff should identify all these issues and put them in order of

priority for the negotiators. Common issues relating to user dissatisfaction include:

- Continual errors and downtime during operation. When software or hardware errors repeatedly interrupt a user's operations, an intensive debugging effort with the right vendor staff may be sufficient to correct the problem. During negotiations, the company might ask for such help.

- The software system design does not meet the user's needs. Users may find that standard software does not match their procedures. For example, a distribution company may have a special way of collecting orders and arranging them for warehouse use. If a standard software system does not take these requirements into account, the distribution company may be unable to use it.

- The computer hardware configuration may be inadequate for the user's business. For example, the vendor's salesman, to keep the price low, may recommend a configuration with inadequate memory for a business's requirements. After several months the user may find that more hardware must be bought to keep all necessary current business data on-line and allow room for expansion.

- Inadequate terminal response time can prove extremely frustrating. An on-line system into which a user can enter data directly on a terminal must respond quickly. An inadequate order entry system may cause data entry clerks to sit staring at blank terminal screens for more than 15 seconds before getting an appropriate response. Such poor response time can destroy a system at its inception, since operations staff will refuse to use it.

**Step 3: Examine the agreement.** To develop a negotiating strategy, the user must study the contract, especially with regard to the vendor's performance obligations. Often the agreement is vague and the performance requirements either ambiguous or undefined. Next, the user must formulate the company's requirements for the computer system.

Then the user must decide where the company's requirements differ from the vendor's contractual performance obligations. The negotiating strategy must consider whether the company's requirements are reasonable within the context of the price and scope of the agreement and whether the company is justified in its demands even though the agreement does not define the system. In this evaluation, the user will find the vendor's prior representations and sales literature helpful.

**Step 4: Involve senior management.** Once the user has defined the company's needs, senior management should meet with technical advisers and perhaps with the company's legal advisers. All parties should be certain that they agree on the negotiating objectives, including a list of priority demands.

Their strategy will be based on the premise that the installed

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## IN DEPTH/DON'T RUSH TO COURT

computer system can be salvaged and that the company can use it effectively in its operations. If the system is hopelessly deficient, the user may need to consider litigation.

**Step 5: Present a detailed demand.** The user's responsible executive should draft a detailed demand, which can be in the form of a long letter to the vendor outlining the difficulties with the system and the necessary corrective action. This formal demand serves four important purposes:

1. It puts the user on record about the deficiencies of the computer system. If the negotiations are unsuccessful, the demand can serve as a key document in subsequent litigation to prove that the company notified the vendor of the system's defects.

2. It shows the vendor the seriousness of the user's concerns. A vendor often receives vague complaints from any number of users, who may drop their demands if the vendor ignores them. A well-presented demand shows the vendor that the company has critical problems that it must address and indicates that the user has spent considerable time evaluating these.

A vendor that ignores a detailed demand and refuses to negotiate in good faith knows that legal proceedings may follow. Thus, it is usually not necessary for the user to threaten a lawsuit.

3. If drafted with the assistance of a person knowledgeable about the data processing industry, a detailed demand defines the hard issues between the user and the vendor. It is astounding how often users and vendors engage in acrimonious disputes without clarifying these problems.

4. It sets the tone for the impending negotiations. As a rule, the party that makes the first proposal defines the procedure for solving the problems involved and, therefore, gets a better result. The detailed demand should set forth the company's difficulties with the system, the performance promises made by vendor representatives, the system problems encountered and recommendations for solving these. The vendor, having specific items to which it can respond, can evaluate its own position.

Once senior managers from both sides face all the issues, realistically define their positions and understand their strengths and weaknesses, the two sides have a basis for compromise. It is the obligation of the user's responsible executive, with the assistance of technical and legal advisers where necessary, to evaluate the company's business and legal position carefully.

The user may have unrealistic expectations of the capabilities of the computer system. Once senior management understands the system better, it can help the user determine a negotiating strategy.

**Step 6: Conduct negotiations.** After the user department has defined its own requirements and the responsible executive has presented demands to the vendor, an experienced nego-

tiator can then represent the user's position. If the vendor wants a good-faith resolution of the conflict, both parties can generally identify and agree on the performance required of the vendor. A resolution of the dispute may simply call for the vendor to dispatch technical staff to make the corrections.

**Step 7: Draw up an agreement.** Complex problems between the vendor and user

*Sometimes a computer system is hopelessly defective, and no amount of effort on the part of the vendor can salvage it. In such a situation, the company may make the hard decision to discard the system and obtain a replacement.*

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## IN DEPTH/DON'T RUSH TO COURT

may necessitate a written agreement covering items generally included in any well-drafted system development contract:

- Specific performance parameters.
- A realistic installation timetable.
- Performance milestones for the vendor, to which payments due or additional payments should be tied.
- Specification of all additional equipment or pro-

gramming services.

After the agreement is signed, the user should monitor the vendor's performance and make periodic progress reports advising management about any difficulties encountered during a reporting period and about the performance anticipated in the next period.

#### Final recourse

Sometimes a computer system is hopelessly defec-

tive, and no amount of effort on the part of the vendor can salvage it. In such a situation, the company may make the hard decision to discard the system and obtain a replacement.

Regardless of whether a company decides to negotiate a settlement or litigate, management should seek technical and industry knowledge and define the issues carefully.

Planning is crucial when

litigation seems inevitable, since a company must preserve the facts for presentation to a court, perhaps years later.

After the company has discarded the defective system, management should evaluate the time, money and effort spent to obtain the system and the overall destructive effect on the business.

The extent of the financial losses will determine

whether the company should spend the time and money necessary to seek remedies in the courts.

To initiate a lawsuit, the company must be satisfied that the vendor has, in fact, breached a legal duty. A company contemplating legal action should pursue the following steps:

- Make a record. A user that intends to claim breach of contract or fraud should

*Once senior managers from both sides face all the issues and realistically define their positions, the two sides have a basis for compromise.*

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A DP MANAGER'S GUIDE  
TO DISC DRIVE  
PERFORMANCE EVALUATIONS

make a record of its complaints to the vendor. The responsible executive should collect all letters or documents reflecting the user's complaints.

Before the company discards the system, it might send a final letter to the vendor with an unconditional demand to cure the defects. Such a record prevents the vendor claiming at some later date that it was unaware of the complaints or did not have adequate time to resolve them.

- Document the claim. Before a company brings a claim to trial, memories may fade about the computer system's problems. Key employees may leave the company or be unavailable at the time of the trial. The user must, therefore, make every effort to preserve all records that would reflect the troubles with the computer system.

Computer printouts that contain examples of inaccurate or incomplete data or reports should be kept. Hardware service support records should be maintained. System operators should keep a log of software and hardware errors they have encountered. If the software is evidently defective, users should preserve backup copies for presentation by expert witnesses at the trial.

- Retain an expert. Complex computer litigation often depends on the testimony of outside expert witnesses. If a company is about to discard a system of computer hardware or software, it should retain an expert to study, evaluate and document the problems before usage is discontinued.

Such documented observations of the system in operation may be vital evidence at the trial.

- Identify liability. Before filing suit, the user, with the assistance of its attorney, must define the legal theories of liability against the vendor. Counsel can



## IN DEPTH/DON'T RUSH TO COURT

draw these theories from a synthesis of the vendor's representations, provable defects in the system, the contract terms and applicable state law. Detailed descriptions of potential theories fill volumes of legal text, but the user should be aware of basic rules.

Generally, in any suit for failure to perform under a computer contract, the user will claim breach of contract on the part of the vendor and

allege that the computer system delivered was not the system for which the parties contracted.

For example, if the vendor has promised to design and implement an order entry system and subsequently fails to deliver, the vendor has breached the contract and is liable for damages. The user must examine the contract, the vendor's proposal and the user's request for a proposal to determine

how the vendor has failed to perform.

#### Implied warranties

Unless they are specifically disclaimed, computer contracts may be subject under state law to implied warranties found in the Uniform Commercial Code. The delivered system must be merchantable and fit for the particular purposes for which it was delivered, as these are defined by statute.

The vendor's contract frequently contains a limitation of liability that precludes a claim in excess of the amounts paid under the contract. There may be a disclaimer for consequential damages, including lost profits, business and employee time, as well as clerical overtime. If the user sues only for breach of contract, it may be unable to collect consequential damages.

Users may recover conse-

quential damages, however, by claiming fraud and misrepresentation by the vendor. The fraud can stem from the written agreement, but it can also stem from the oral representations that induced the user to sign the contract.

Fraud is particularly applicable in the case of a first-time user who claims to have relied entirely on the vendor's representations. The fraud claim gives the user the means of circumventing any contractual limitation of liability clauses, since the court will disregard the contract limitations if the user can prove the claim. Besides recovering consequential damages, the user may be able to claim and recover punitive damages.

To prove fraud, a number of important elements must be present. The vendor must have made material misrepresentations with respect to the system, knowing that they were false, and have had the intent of inducing the user to enter into the contract. The user must have relied on the misrepresentations and have been damaged as a result.

Many states have adopted broad-ranging consumer protection statutes under which fraudulent or deceptive trade practices in the sale of goods or services are actionable. Many of these statutes define businesses as consumers and many also include payment of attorneys' fees.

#### Monetary damages

After defining the theoretical legal liability of the vendor, the company must determine the monetary damages. In this, the user must be creative. In addition to any sums paid to the vendor under the contract, the user must quantify any damages resulting from loss of profits, business and competitive advantage. The user must also be able to document any additional costs that are claimed.

To qualify for punitive damages, which are over and above the contract, and consequential damages (such as lost profits, services of a consultant and other costs in addition to what vendors actually receive), the user must prove that the vendor's actions in the relationship were willful, wanton, malicious and intentionally disregarded the user's rights.

A company might claim punitive damages when, for example, the sales representative or the marketing literature misrepresented the capabilities of a system. The vendor might claim that the system could handle 12 terminals when use of that number of terminals would make response time so slow as to render the system useless.

Such misrepresentations might have been made in the vendor's proposal. Pretrial

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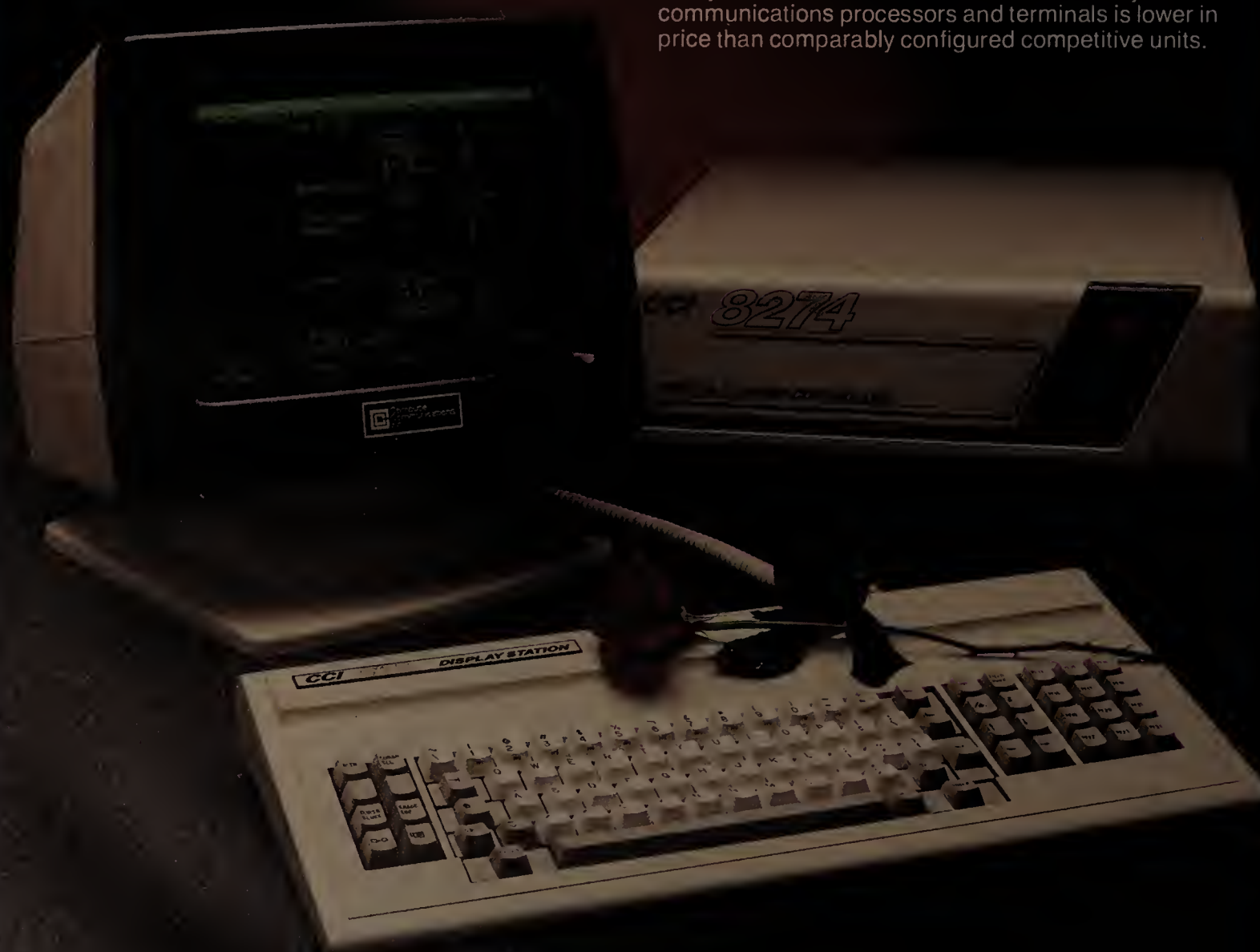
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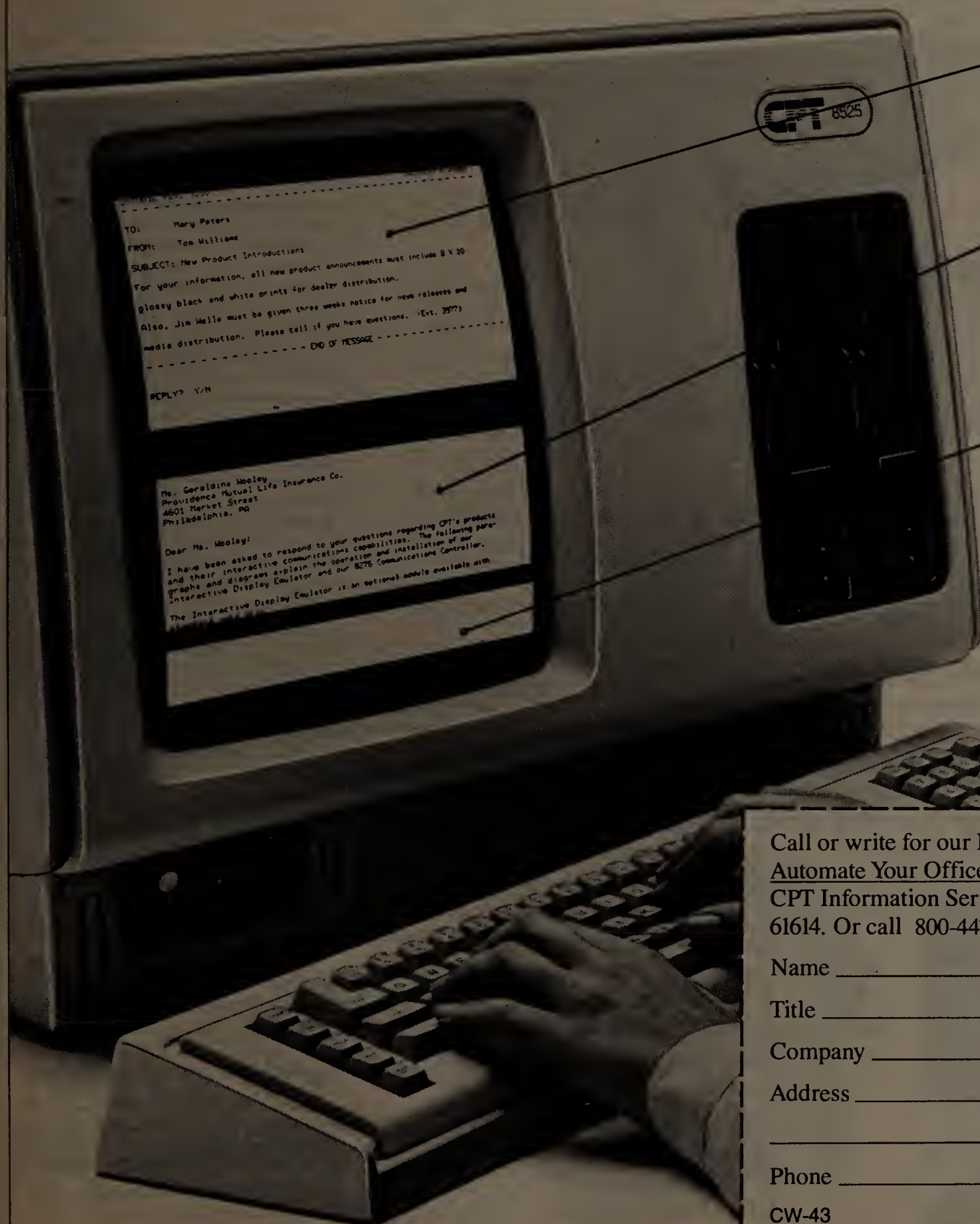
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## IN DEPTH/DON'T RUSH TO COURT

discovery procedures may reveal that the vendor has test results or other documents showing that it was aware that the system was incapable of the performance claimed for it. Punitive damages are usually more difficult to obtain than damages for breach of contract or fraud.

**Glovatorium v. NCR**

The effectiveness of a fraud claim in computer-related litigation and the danger of large punitive damage awards against vendors were highlighted in a 1982 decision of a U.S. Court of Appeals in California, *Glovatorium v. NCR Corp.*, which reviewed a jury award to the plaintiff of \$285,000 compensatory damages for fraud and breach of contract plus punitive damages of \$2,073,000.

Glovatorium, a wholesale cleaner

*The court further found that the success of a system is tied to the capacity and willingness of the manufacturer to provide the necessary support; failure to do this can cause destruction of the business.*

of leather and suede, purchased an NCR computer system that never functioned as promised. The court found that NCR intentionally engaged in a pattern of deception by switching defective computer equipment and that NCR had failed to disclose that its hardware had a high failure rate.

Glovatorium, being a first-time computer user with little knowledge of computers, bought the system on the basis of NCR's promotion and representations. After the system

was installed, the company could not make it perform well. After two years of trying unsuccessfully to make the system work, Glovatorium sued NCR.

Glovatorium introduced evidence to show that the NCR system had suffered both software and hardware failures. As to software, it was shown that the system was never able to perform general ledger or other accounting functions. With regard to hardware, it was shown that the disk drive, an essential hardware

component, had frequently failed for extended periods of time. According to the trial court, persistent failure of the disk drive, even though it was repaired after each failure, rendered the system so unreliable as to be useless.

The trial court held that there was ample evidence to show that NCR had misrepresented the nature and capacities of its system to Glovatorium. Additionally, after delivery of the system, NCR did not provide the programming and most of the promised maintenance and support services.

**Tied to survival**

The judge observed that once a business such as Glovatorium converts its operations to a computer, its survival as a business is tied to the performance and reliability of that computer.

The court further found that the success of a system is tied to the capacity and willingness of the manufacturer to provide the necessary support; failure to do this can cause destruction of the business. The judge observed that NCR had shown an utter disregard of the required responsibility in this case.

The appeals court, noting that NCR had apparently committed the kind of action or wrongdoing that punitive damage awards were meant to prevent or deter, permitted the large punitive award of the lower court to stand.

The Glovatorium decision represents the application of California punitive damages law to a claim of intentional fraud. The circumstances under which punitive damages may be awarded vary from state to state, and the result in this case would not necessarily be the same in other jurisdictions.

Once serious difficulties arise in computer installations, senior corporate management faces difficult decisions in seeking remedies through negotiation or a lawsuit. In either event, the internal operations of the company can be affected, and large financial commitments may be at stake.

Company managers must approach computer installation difficulties in a structured manner and assure themselves that the result they seek is both realistic and practical. A haphazard and unstructured approach can result in both an unsuccessful claim and a disaster for the company. ‡

**About the authors**

Richard Raysman is an attorney with Brown, Raysman & Millstein in New York. He is chairman of the New York State Bar Association Computer Law Subcommittee.

Peter Brown is an attorney with the same firm. Both authors write a monthly column on computer law for the New York Law Journal.

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# SOFTWARE & SERVICES



## Data flow charts not for everyone

Data flow diagrams are a classical analytical tool dating back to the origins of the data processing industry. As a tool, they aid in coming to grips with the commonality and complexity of functions that are automated. They have long been used in the structured environment for the decomposition and simplification of the processes accomplished by a system.

But there is serious question as to their applicability to the on-line, integrated environment in their current form. The problem arises because in that environment, when built properly, data does not flow.

To understand the shortcomings of the data flow diagram, consider its origins. The data flow diagram is designed for the batch sequential environment in which there is typically a need for many master files. The master files normally contain a fair amount of redundant data. For example, if a part number exists on one master file, it is common to find the part number on several files. In general, there is much overlapping data in the batch sequential environment.

Overlapping data occurs as a result of the limitations of the sequential environment itself, primarily as a by-product of tape-oriented systems. Tape-oriented systems are limited by the number of tape drives that are available. To access 5% of the data on a tape requires accessing 100% of the data. If one program is accessing or updating a tape, it cannot be accessed by another program until the

See **FLOW** page 99

*Inmon is a director at Coopers & Lybrand in Denver, a noted author on the subject of data base design and a regular contributor to Softline.*

## VDT growth bedevils firm

### Sophisticated security to the rescue

BIRMINGHAM, Ala. — A proliferation of terminals throughout the Southtrust Corp. here presented management with two basic problems: ensuring data integrity and prohibiting employees from viewing information for which they had no clearance.

A \$3 billion financial services company, Southtrust supports a statewide banking organization with a full-service bank and discount brokerage, investment, mortgage and data services. And, "in the banking industry, a completely secure data environment is essential for maintaining a good customer service reputation," said Bill Ledford, Southtrust's DP audit manager.

When Southtrust first went on-line under IBM's MVS operating system with its Amdahl Corp. V6 computer, software was written in-house to secure data at the operator transaction level. "It didn't take us long to realize that this system was insufficient," Ledford said. "Our system was growing rapidly with new applications, and security was not as tight as it could have been. We needed a more sophisticated

security system. That's when we installed Alert/CICS."

Alert/CICS, marketed by Goal Systems International, Inc. of Columbus, Ohio, was installed 18 months ago to protect data in Southtrust's network of 250 terminals and 500 users. "Today we have much better control over who accesses and alters sensitive information," Ledford said. "This security will be especially important when we offer our bank customers read-only access to their accounts."

Southtrust security administrators currently use Alert/CICS to protect all transactions, files and programs. "The software has proved itself most adaptable," Ledford said. "When we first installed the product, Alert/CICS took up more space than we could afford, so we modified the system to use less. We can expand later if necessary."

Ledford said all security rule changes are made on-line with Alert/CICS. "The system also gives us 'cloning' capabilities," he said. "For example, if I have sev-

See **ALERT** page 98

## AIC upgrades Intellect lexicon

By John Gallant  
CW Staff

WALTHAM, Mass. — Artificial Intelligence Corp. (AIC) has introduced the first offering in the 300 series of its Intellect natural language software system for IBM mainframes.

Announced at a recent press conference here, Release 301 of Intellect features an Interactive Lexicon Facility that reportedly automates the construction of the system's initial data dictionary, dubbed the lexicon, and simplifies the ongoing enhancement of that lexicon. According to an AIC spokesman, the new release will be available in the fourth quarter and will be upwardly compatible with AIC's current 200 series of Intellect.

Release 301's Interactive Lexicon Facility consists of three components: an Instant English Facility, an English Definition Facility and a Lexicon Screen Editor.

The interactive components were designed to reduce "dramatically" the effort required to apply Intellect to new end-user applications, the spokesman said.

The Instant English Facility reportedly allows immediate use of Intellect on any file in an existing mainframe data base by transforming data dictionary information describing the data base into a lexicon for Intellect's use. The transformation process is fully automatic and takes place the first time Intellect accesses the file, according to the spokesman.

The English Definition Facility takes over where the Instant English Facility leaves off, he noted. It enables end users to add definitions to the system's lexicon by entering a simple English definition, which is then interpreted by Intellect's English parser feature. The definition is added to the lexicon for future use, providing

See **AIC** page 99

■ Software development tools announced for Digital Equipment Corp./88

■ "Boss" eases job scheduling on IBM large systems/88

■ NCR Corp. pledges to improve software support, documentation/89

■ Encryption package out for IBM processors/89

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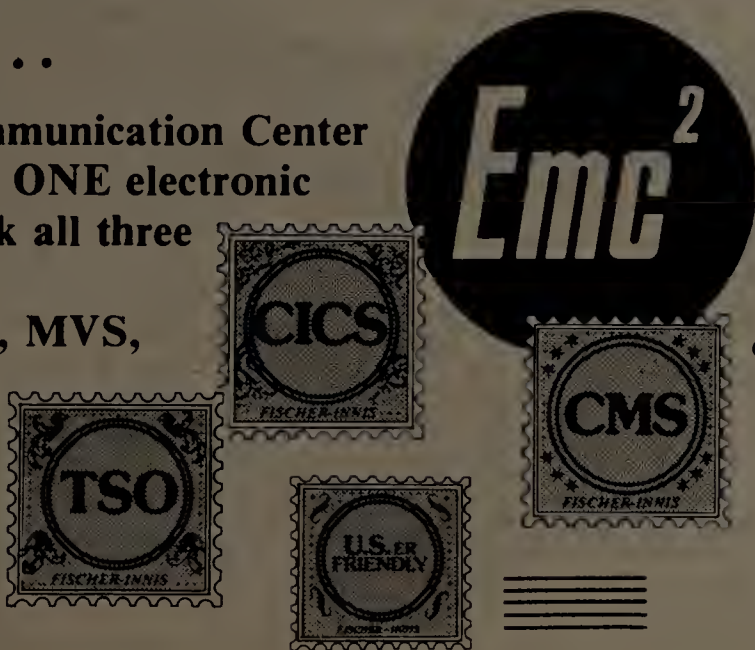
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## SOFTWARE &amp; SERVICES

# Job scheduling system debuts for IBM 30, 4300 series

WAUKEGAN, Ill. — Database Technology Corp. has announced a real-time job scheduling system for IBM 30 and 4300 series and compatible processors under the MVS operating system.

Dubbed the Balanced Operation Scheduling System (Boss), the software is designed to eliminate manual

job scheduling and requires no modification to the host operating system or JCL, the vendor said. Boss automatically schedules, releases and controls jobs, and it monitors their execution and provides summary information on each job run.

The system's simulation capability reportedly ana-

lyzes the effects of adding or deleting jobs, changing job sequences or altering hardware configurations. Other features include a set of commands to add, delete or resequence jobs; an on-line monitor that records actual runtimes, late jobs and performance of individual shifts or workstations; and an on-

line updating facility that can alter job sequencing, add and delete jobs or respond to unscheduled changes in work load.

In addition, the Boss is said to provide hard-copy performance reports as well as schedules and resource requirements listings. The system reportedly balances re-

sources such as memory requirements, CPU cycles and number of tape drives, and it flags and logs jobs automatically as they are initiated and terminated.

The Boss is priced at \$29,900 and is available from Database Technology, 850 S. Greenbay Road, Waukegan, Ill. 60085.

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## Firm offers 'Sourcetools' for DEC

PORTLAND, Ore. — Oregon Software, Inc. has announced Sourcetools, which the company described as a computer-aided software development and management system for Digital Equipment Corp.'s PDP-11 and VAX-11 processors under DEC's RSX-11, RSTS/E and VMS operating systems.

According to a spokesman, Sourcetools automatically manages software development projects and is useful for projects involving numerous source files, joint development by several programmers or the creation of cross-system software. It reportedly can be used with any computer language, including C, Fortran, Cobol and Ada.

The system is said to operate in conjunction with and support cross-development software projects, and it uses the resources of the host computer to build application code and manage the development process.

### Three packages

It reportedly consists of three program packages:

- Sourcecon contains four programs that control the creation and modification of source code files.

- Make, the second package, automatically keeps programs up-to-date as components are changed.

- The third package is made up of two programs named Text Compare (Txtcom) and Stream Editor (Sedit). Txtcom compares the contents of two files and creates a sequence of line-editing commands, and Sedit reads the Txtcom script and applies the necessary changes to other source files.

Sourcetools is priced at \$4,500 for the RSX operating system and for VMS running in RSX-compatibility mode and \$3,600 for RSTS/E. The pricing includes one-year support.

More information is available from Oregon Software, located at 2340 S.W. Canyon Road, Portland, Ore. 97201.



## SOFTWARE &amp; SERVICES

## NCR vows to improve user service

By Tom Henkel  
CW Staff

CINCINNATI — While stating that NCR Corp. is generally pleased with the quality of service it provides users, the firm's president and chief executive officer, Charles Exley, told approximately 1,400 users of NCR systems gathered here earlier this month that software support and product documentation are sore spots that the firm must improve.

Speaking at the 14th Annual International NCR Users Conference, Exley acknowledged that it often takes NCR several weeks to develop fixes for users' software problems. Admitting that is too long, Exley vowed that NCR will try to cut that time. One way the firm hopes to do so is to spend more time testing software before it is released to users, Exley said.

Roughly 55% of the calls placed to NCR's central support facility have nothing to do with either hardware or software problems, but are general inquiries, Exley noted. Part of the reason for the high number of inquiries, he said, may be that NCR's product documentation is too difficult to understand.

Exley vowed that NCR will try to improve its documentation as well as its software service. But he quickly added that many users call the NCR central support facility instead of looking in documentation for the answers to their questions. He hinted that NCR may institute charges for users who habitually call the support facility when they do not actually have hardware or software problems.

When it comes to maintaining hardware, Exley said, NCR is generally pleased with its level of support. To improve that support and save time in the process, NCR field engineers will begin carrying hand-held terminals to user sites sometime this year, he said.



## Fischer-Innis offers data security package

NAPLES, Fla. — Fischer-Innis Systems Corp. has announced Kryptonite/I, a data security package for IBM processors.

Kryptonite/I uses data encryption to protect computer-based information. It features an implementation of the Data Encryption Standard, developed for the U.S.

National Bureau of Standards and approved by the National Security Agency.

The spokesman said the system can encipher different fields of data in a file with separate keys, making individual pieces of information accessible on a need-to-know basis. Encryption keys can be stored in a personal li-

brary, and the system automatically retrieves the proper key from that library as it is needed.

Kryptonite/I runs on all IBM 370 architecture machines under all major operating systems, the spokesman said. Because the system supports all record formats, encrypted data can be com-

municated in complete security between systems.

The monthly license fee for Kryptonite/I for IBM's MVS and VM operating environments is \$500; for the DOS environment, the monthly license fee is \$350.

Fischer-Innis Systems is located at 4175 Merchantile Ave., Naples, Fla. 33942.

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## SOFTWARE &amp; SERVICES

## SYSTEMS SOFTWARE

**TOUCH TECHNOLOGIES, INC.**  
**TTI Sort Version 2.1**

Touch Technologies, Inc. has announced Version 2.1 of TTI Sort, a sort package for Digital Equipment Corp.'s VAX-11 series minicomputers under the VMS operating system.

In addition to the transparent interface between user applications and the VAX-11 Sort, Version 2.1 now supports calls through DEC's Digital Command Language from both immediate mode commands and command files.

A perpetual license for TTI Sort sells for \$1,295 for the first CPU and \$300 for each additional CPU.

*Touch Technologies, Suite 101, 609 S. Escondido Blvd., Escondido, Calif. 92025.*

**SOFTWARE TECHNOLOGIES AND RESEARCH, INC.**  
**Dads Version 1.2**

Software Technologies and Research, Inc. (Star) has announced the release of Version 1.2 of its Dynamic Allocation/Deallocation Subsystem (Dads) for IBM's CICS/MVS environments, with six new file management and control features.

The new features are: automatic transaction enable and disable; control file browse; a batch interface; batch control file conversion; emergency allocation bypassing; and automatic time allocation of files, data bases and classes, according to the vendor.

The product's automatic time allocation facility allows users to preset up to eight daily time slots to allocate and deallocate files, data bases and classes automatically, according to the vendor.

Dads 1.2 is available for a permanent license fee of \$7,500 for systems using IBM's DL/1 and \$5,500 for non-DL/1 users. It can also be rented or leased from Star. The company offers a 30-day free trial.

*Software Technologies and Research, 41 New Britain Ave., Rocky Hill, Conn. 06067.*

**PRODUCTIVE SOFTWARE SYSTEMS, INC.**  
**Robot/3000 Release 4.0**

Productive Software Systems, Inc. has announced Release 4.0 of its Robot/3000 automatic documenter system for users of Hewlett-Packard Co.'s HP 3000 processor.

According to a spokesman, Robot/3000 is an active data dictionary that provides on-line inquiry to a cross-referenced data base of a user's source code library. Users are not required to enter data manually for the data base. The new release is said to support all HP 3000 Cobol users.

In addition to automatically tracking where all data items and COPY statements are used, Release 4.0 reportedly provides tracking of all CALL and \$INCLUDE statements. The system can extract and track file descriptions and working storage data names from any Cobol source file.

The new release supports variable-length record formats and fixed record lengths, and it features an interface to HP's Dictionary/3000 passive data dictionary.

Robot/3000 has a one-time perpet-

Continued on page 93

# Cincom releases AR/CM for Total, TIS

CINCINNATI — Cincom Systems, Inc. has announced an on-line Accounts Receivable and Credit Management system (AR/CM) for users of its Total and TIS data base management systems (DBMS).

According to a spokesman, AR/CM is written in Cincom's Mantis fourth-generation application development system.

It provides financial managers with the ability to access information directly and develop customized queries and extracts, according to the spokesman for the vendor. It is said to provide information necessary to make credit decisions and forecast cash receipts. The system is also said

to be fully integrated with Cincom's DBMS.

The spokesman said the system allows real-time review of credit status, aging, payment and high-credit trends.

Customers can be grouped according to user-tailored definitions, and finance charges and discounts can be included on customer statements, the spokesman said.

Collection of delinquent accounts can be expedited through the system's automatic generation of collection notices, dunning letters and past-due reminders.

The system is said to provide rapid feedback on errors and receipts and

automatic posting of lockbox payments without clerical effort.

AR/CM reportedly provides on-line access to all functions and is written with over 200 user-assistance messages that facilitate a logical flow between functions.

A system administrator can control user access to the data base, and users can be granted no access to the system, access to read and update or read only.

The Mantis system is a prerequisite for use of the AR/CM system, the spokesman said.

AR/CM is priced at \$65,000 from Cincom Systems, 2300 Montana Ave., Cincinnati, Ohio 45211.





## SOFTWARE &amp; SERVICES

Continued from page 92

ual license fee of \$5,000 for a single CPU.

*Productive Software Systems, 5617 Countryside Road, Edina, Minn. 55436.*

#### COMPUTE (BRIDGEND) LTD.

##### CBL Vcat

Compute (Bridgend) Ltd. (CBL) has announced the CBL Vsam Catalog (Vcat) package for IBM Vsam performance and capacity planning.

According to a spokesman, CBL Vcat reads the ICF/Vsam catalog as a standard Vsam file, storing information required later to minimize I/O activity.

The system opens the catalog only to read and does not tie up system resources. CBL Vcat is written in as-

sembler, the vendor said.

The system reportedly runs on ICF and Vsam catalogs transparently, and it can be run on any operating system that supports Vsam, the spokesman said.

CBL Vcat can also be used to tune and monitor Vsam files in the ICF/DF/EF catalog environment under MVS, according to the vendor spokesman.

It reportedly aids in system planning, simplifies conversions and gives users a "what-if" simulation facility.

The monthly license fee for CBL Vcat is \$90, and the system can be perpetually licensed for \$3,600, the vendor said.

*Compute (Bridgend), Suite 107, 30 Baywood Road, Rexdale, Ont., Canada M9V 3Z1.*

#### MAERSK DATA USA, INC.

##### MD-Plot

Maersk Data USA, Inc. has announced MD-Plot, a software package that the company said will allow IBM mainframe graphics users to access Hewlett-Packard Co. plotters.

According to a spokesman, MD-Plot collects the output files from IBM's Graphic Data Display Manager (GDDM) graphics system and converts them into HP plotting commands.

The converted print file can be transferred to the plotter via a spool system. All GDDM applications, including IBM's Chart Utility, Graphpak and Presentation Graphics Facility, reportedly are compatible with MD-Plot.

The system is compatible with

IBM 4300 and 30 series mainframes and HP 7470A and HP 7550A plotters.

Each plotter reportedly can be linked to the network of terminals via a protocol converter. MD-Plot is said to be compatible with most IBM operating systems and is priced at \$4,000.

*Maersk Data, Suite 3527, One World Trade Center, New York, N.Y. 10048.*

#### SPECTRUM INTERNATIONAL, INC.

##### Lifecycle Manager

Spectrum International, Inc. and Nastec Corp. have announced Lifecycle Manager software to aid software development on Nastec's Case 2000 workstation.

Lifecycle Manager is targeted to insurance, banking and information services industries, engineered product companies, government agencies and software contractors.

The program puts tutorial, self-help functions for software development on-line, making them accessible with one or two keystrokes, the vendor said.

The software relies on the Nastec Case 2000 workstation to integrate the software functions into a single management tool. It also provides related materials, on-line instructions and examples of completed tasks to assist analysts and programmers.

The software sells for a one-time price of \$29,000, including 40 hours of consultation and training. Additional workstation licenses range from \$1,800 to \$3,000 each, the vendor said, depending on the number of workstations.

*Spectrum International, 6101 W. Centinela Blvd., Culver City, Calif. 90230*

#### ALDON COMPUTER GROUP

##### Scompare

Aldon Computer Group has announced Scompare, a source program comparison utility for IBM mainframes and Hewlett-Packard Co. HP 3000 minicomputers. The product is said to identify and track all changes made to source code, thereby providing automatic documentation of program changes.

Scompare can be used on Cobol, Fortran, Pascal, RPG, SPL, Transact and Basic programs, as well as on Cobol Copy libraries, job control streams and other files containing data of up to 80 characters, the vendor said.

Scompare is priced at \$3,500, the vendor said.

*Aldon Computer Group, 405 14th St., Oakland, Calif. 94612*

#### NICHOLS & CO., INC.

##### N5500/Niers

Nichols & Co., Inc. has announced a project management package designed for the IBM VM/CMS operating environment.

The N5500/Nichols Interactive Entry and Retrieval System (Niers) package reportedly includes an interactive entry and retrieval module for on-line use, according to the vendor. Features include resource management, network analysis, costing and budgeting and graphics output capabilities.

In the post-project stage, the package reportedly can be used to calcu-

Continued on page 94

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GENERAL  ELECTRIC



## SOFTWARE &amp; SERVICES

Continued from page 93

late future resource requirements for an organization. Group or individual performance analysis and prediction reliability testing facilities are also included, the vendor said.

Prices for N5500/Niers begin at \$38,000.

Nichols & Co., 5839 Green Valley Circle, Culver City, Calif. 90230.

#### ROBERT ELLIS ASSOCIATES 7080 Simulator

Robert Ellis Associates has announced the 7080 Simulator, which is described as a software package that enables programs written in IBM 7080 code to run on any IBM 370 or 370-type system without an emulator.

According to a spokesman for the

vendor, the 7080 Simulator is a collection of PL/I modules that execute 7080 object code by simulating 7080 functions.

Control cards relate internal file references to external Job Control Language data dictionary statements, indicate alteration switch settings, define optimization parameters and provide additional optional facilities.

The vendor spokesman said the simulator appears as a normal job, requiring no special service to either the operating system or to the operator.

The 7080 Simulator is priced at \$125,000, according to the spokesman for the vendor.

Robert Ellis Associates, 474 Hughes Road, King of Prussia, Pa. 19406.

#### APPLICATION PACKAGES

#### DALY & WOLCOTT, INC. Accounts Payable Management System

Daly & Wolcott, Inc. has announced an accounts payable software package for users of IBM's Distributed Financial Accounting System II on the System/36.

The Accounts Payable Management System reportedly allows users to review open payables as well as payment histories to vendors. The menu-driven inquiry screens have vendor profile and user comment lines for vendor comments or miscellaneous notes.

The package includes several re-

ports: an aged open payables report utilizing an "as of" date; a committed payments/cash requirements report; and a vendor comment listing report.

The package is priced at \$650.

Daly & Wolcott, 120 Lavan St., Warwick, R.I. 02888.

#### ARIZONA INDUSTRIAL MANAGEMENT SYSTEMS, INC. Materials Management Reporting Package

Arizona Industrial Management Systems, Inc. has announced a materials management package that is said to enhance the reporting capabilities of Hewlett-Packard Co.'s Materials Management (MM)/3000 program for the HP 3000 minicomputer.

The Materials Management Reporting Package reportedly enhances the MM/3000 for purchasing, inventory and production control and financial reporting. The purchasing reports in the package include purchase orders by vendor, purchase expediting, purchase orders by part, vendor delivery performance, cash placement, cash commitment, purchasing register; and print purchase orders, the vendor said.

Enhancements to increase control and financial reporting from the production and inventory control areas include work order levels, daily stock activity report, master schedule report, three physical count reports and costed management reporting package gross requirements reports, the vendor said.

The package is priced at \$1,450.

Arizona Industrial Management Systems, P.O. Box 27822, Tempe, Ariz. 85282.

#### THE SOFTWARE CONNECTION, INC.

##### Kwic-Search

The Software Connection, Inc. has introduced a package that reportedly enables users of Wang Laboratories, Inc. VS series computers to retrieve documents by searching for any word or group of words in a stored document.

Kwic-Search enables the user to enter a word or group of words to which the system responds with a list of documents containing the requested information, a vendor spokesman said. The user can enlarge the group of words to locate the document more easily.

The program is priced at \$3,000.

Software Connection, Suite 200, 5655 S. Yosemite St., Englewood, Colo. 80111.

#### CHESELL-ROBOCOM CORP. Professional graphics library

Chessell-Robocom Corp. has announced a professional graphics library designed for use with Robo Systems CAD-1 computer-aided drafting and design system. The CAD-1 can interface with Apple Computer, Inc.'s Apple II+ and Apple IIe microcomputers.

The library disks reportedly hold predrawn symbols, components and typefaces. As with drawing templates, the disks can be used more than once. Library symbols can be changed in size, orientation, color and line type, a spokesman said.

The library comprises Alphabet-Futura, Alphabet-City Medium and Alphabet-Helvetica typefaces; analog schematic symbols; digital sche-

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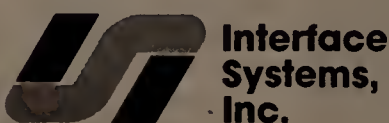
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Ask about the ISI-487, too, a high speed dot matrix printer that allows you to tear off output immediately, without wasting forms. Also prints large characters for labels.





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## SOFTWARE &amp; SERVICES

**Continued from page 94**

matic symbols; printed-circuit board artwork; fluid power schematic symbols; chemical engineering process symbols; business graphics charting aids; and world sketch maps, the spokesman said.

Prices range from \$100 to \$250 per selection.

*Chessell-Robocom, 111 Pheasant Run, Newtown, Pa. 18940.*

#### **INTERNATIONAL TECHNOLOGY MARKETING, INC.** **CAD/CAM service**

International Technology Marketing, Inc. (ITM) has announced a service that provides in-depth information on the computer-assisted design and manufacturing (CAD/CAM) industry.

According to ITM, the service helps companies track industry trends and growth and provides financial and technical product data for more than 50 CAD/CAM system, hardware and software vendors.

Subscriptions to the service include unlimited use of the vendor's telephone information service, an annual report with interim supplements and a three-day seminar.

Corporate annual subscriptions are available at a cost of \$12,000. Secondary company annual subscriptions cost \$6,000 each.

*ITM, 120 Cedar St., Wellesley Hills, Mass. 02181.*

#### **ARCAD** **Aids**

Arcad has announced the Architectural Interactive Design System (Aids) computer graphics software for the Digital Equipment Corp. VAX-11 line of processors.

According to a spokesman, the software encompasses a range of applications for architects, engineers and others in the design and construction industries. The system is said to allow for overlays of all types of architectural and engineering drawings, space planning, interior design, component costing and graphics presentation displays.

With Aids, designers can create a three-dimensional model of a building. Solids modeling capabilities allow a user to "paint" a computer picture of a proposed project. The software includes a library of 2,000 standard design symbols and details.

A single workstation license for Aids is priced at \$7,000; a license for two or more workstations is priced at \$14,000.

*Arcad, 445 S. Figueroa St., Los Angeles, Calif. 90071.*

#### **TEKTRONIX, INC.** **VLSI Verification**

Tektronix, Inc. has introduced very large-scale integration (VLSI) Verification software for use with its DAS 9100 digital analysis system. The software, compatible with Digital Equipment Corp. VAX-11 series computers, reportedly gives the DAS 9100 the capability to test microprocessor chips.

The software reportedly allows fabricated chip designs to be completely tested and verified and is said to interface with other VAX-11-based engineering tools, such as logic simulators.

Using the software in combination with the DAS 9100 and the DEC VAX-11 computers, the test pattern

vectors used by a logic simulation program can be downloaded to the DAS 9100 and used as a simulation program during testing.

The VLSI Verification software package is priced at \$1,000. A typical DAS 9100 configuration for use with it is \$40,000.

*Tektronix, P.O. Box 1700, Beaverton, Ore. 97077.*

#### **AQUIDNECK DATA CORP.** **VOX 2.0**

Aquidneck Data Corp. has announced enhancement of its VAX Office Exchange (VOX) office automation software, which reportedly links spreadsheet, word processing, data base, graphics, mail and office management software for the Digital Equipment Corp. VAX-11 series

of computers.

The enhancement, VOX 2.0, reportedly provides a new file management feature that makes computer files meaningful to nontechnical users by permitting them to assign English names to all files and documents.

New VOX 2.0 features also include a user directory, a personal phone book and an action item list that allows users to sort entries by project and date.

VOX 2.0 reportedly supports the DEC Decnet and VAX/Cluster, as well as Word-11, a word processing program from Data Processing Design, Inc., and other software.

The VOX 2.0 software is priced starting at \$3,000.

*Aquidneck Data, P.O. Box 639, Newport, R.I. 02840.*

#### **HANSFORD DATA SYSTEMS, INC.**

##### **Process Analysis-98X6**

Hansford Data Systems, Inc. has announced the Process Analysis-98X6 software package for manufacturing personnel, engineers and technicians. The package reportedly provides data acquisition, storage, management and analytical tools for quality control uses.

Process Analysis-98X6 reportedly provides X-Bar/R and X-Bar/S charts, histograms, normal inference plots, frequency tables, normal probability plots and basic statistics calculations. It reportedly may also be interfaced to data collection devices.

The software package runs on the Hewlett-Packard Co. HP 200 computers and, in its expanded version, on

# HOW TO RUN THE WORLD.



## SOFTWARE &amp; SERVICES

HP 1000 and HP 3000 computers. It is priced at \$3,500.

*Hansford Data Systems, 3055 Brighton-Henrietta Town Line Road, Rochester, N.Y. 14623.*

#### HEALTH SYSTEMS INTERNATIONAL Medicare Code Editor

Health Systems International has announced a medical code editing software package designed to enable hospitals to uncover inconsistencies on Medicare payment claims prior to submitting the claims.

The software, called the Medicare Code Editor, is also available to insurance carriers and Blue Cross medical plans that make payments to hospitals on behalf of Medicare, according to a spokesman for Health

Systems International.

The software determines whether invalid coding has occurred on the claim form as well as whether there are obvious inconsistencies on the claim form, the spokesman maintained.

Medicare Code Editor also determines whether the claim may not be covered by Medicare, according to the spokesman for Health Systems International.

Hospitals can determine in advance whether a Medicare claim will be acceptable to the organizations that provide payment, the vendor said.

The software runs on IBM 4341, 370 and 360 processors. It is priced at \$950.

*Health Systems International, 100 Broadway, New Haven, Conn. 06511.*

#### STRUCTURAL MEASUREMENT SYSTEMS, INC. SMS/Fesdec

Structural Measurement Systems, Inc. has introduced a finite element analysis program for use on Hewlett-Packard Co.'s HP 200 computers.

SMS/Fesdec reportedly is capable of handling skeletal problems (beams), surface problems (plates and shells) and solids problems (bricks).

The program contains modules with the capability to perform linear elastic static analysis, for \$8,000; linear dynamic modal analysis, for \$3,000; and linear heat conduction, for \$1,000, a spokesman said.

*Structural Measurement Systems, 645 River Oaks Pkwy., San Jose, Calif. 95134.*

#### DATA BASE MANAGEMENT SYSTEMS

#### ECONOMIC SCIENCES CORP. MVS Version of EMS

Economic Sciences Corp. has announced an IBM MVS operating system version of its EMS corporate planning software system.

According to a spokeswoman, EMS offers econometric and financial analysis capabilities in addition to a data base management system facility. The system is said to integrate data management with analytical routines and report writing capabilities, and it can coordinate information from specialized data sources.

The system also features analysis tools for general, financial, statistical and econometric analysis.

The MVS version of EMS is priced between \$99,000 and \$150,000.

*Economic Sciences, 2150 Shattuck Ave., Berkeley, Calif. 94704.*

#### LANGUAGES

#### SOFTWARE MANUFACTURERS, INC.

##### Main Selector Unit

Software Manufacturers, Inc. has announced a Main Selector Menu and associated utility programs that automatically load SMI's S-Tran translator software, which translates from Basic to C language and is said to eliminate the need for the user to type Unix commands.

Another feature is the inclusion of options to list the generated C source or Basic language programs and any errors that may have occurred during translation or compilation.

The price for the translator and utility programs is \$1,500 for the initial unit and \$300 per CPU after that.

*Software Manufacturers, 20720 S. Leapwood Ave., Carson, Calif. 90746*

#### REMOTE COMPUTING SERVICES

#### ADP NETWORK SERVICES, INC. IFPS; IFPS/Personal

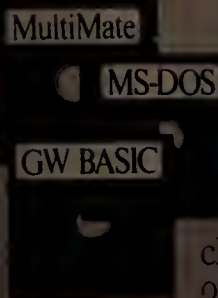
ADP Network Services, Inc. is now offering Execucom Systems Corp.'s IFPS and IFPS/Personal decision support systems through its Network Services Division.

IFPS and IFPS/Personal are said to be nonprocedural systems that allow users to describe their planning or decision-making problems in their own terms. The systems reportedly can be used for ad hoc modeling as well as for applications.

IFPS/Personal, for the IBM Personal Computer and compatibles, reportedly includes a descriptive modeling language, report generator, spreadsheet, full screen editor, color business graphics capability and mainframe communications.

A five-year license for IFPS/Personal is offered for \$1,500, which includes diskettes and documentation. IFPS, via ADP Network Services, is priced based on the extent of connect time and the use of the network's mainframe computer resources. The ADP Network Services time-sharing system is offered for a minimum

Continued on page 98



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# THE CORONA PC

Model 2 T.A. T 3.1 M.L. 4 - Development Corp. \*ITS driver needed for graphics



## SOFTWARE &amp; SERVICES

Continued from page 97

monthly usage charge of \$500.

ADP Network Services, 175 Jackson Plaza, Ann Arbor, Mich. 48106.

## ON-LINE DATA BASES

ADP NETWORK SERVICES, INC.  
M&A Data Base

ADP Network Services, Inc. has announced the availability of the M&A Data Base for daily updates on transactions in progress as well as for access to five years of historical data on major merger and acquisition activity.

For U.S.-based companies, M&A covers mergers, acquisitions, buyouts, divestitures and investments

abroad. It also features information on foreign investments in the U.S., a spokesman said.

M&A is accessible through Screen, ADP's proprietary software. It is available through remote computing; through the ADP/Onsite Service, which places a small mainframe computer on the user's site; and through Datapath, which makes ADP data bases available to microcomputer users.

Prices are charged for data received. A 1,000-char. field costs \$4, the vendor said. Other textual information, such as a company description, costs \$1. Standard & Poor's Computer Services' Compustat subscribers pay 10 cents per Compustat item. ADP also has a proprietary data base for its own securities prices information, for 4 cents per item.

ADP Network Services, 175 Jackson Plaza, Ann Arbor, Mich. 48106.

## TRAINING

MEASUREMENT CONCEPT  
CORP.

## Computer-Assisted Self Training

Measurement Concept Corp. has introduced Computer-Assisted Self Training (Cast), which reportedly is designed for producing instructional programs under Unix and Unix-like operating systems.

Cast can reportedly be incorporated into applications software by publishers interested in providing learning aids to their products' users. It can also be used to create a script to

train and update employees and for training communications between corporate headquarters and branch offices or between a distributor and dealer, the vendor said.

Cast is said to use English-language commands and to allow unlimited branching for diagnostic or remedial sublessons.

It also allows an instructor to specify answers as correct, incorrect or graded and permits screens to be divided into as many as 127 individual windows, with or without overlap, according to a spokesman for the vendor.

The cost for Cast on a multiuser Digital Equipment Corp. VAX-11 series system under Unix is \$2,500, the spokesman said.

Measurement Concept, 1721 Black River Blvd., Rome, N.Y. 13440.

## ALERT from page 87

eral operators from the same department with the same transaction access to add to the system, I just key in the parameters for one and tell the system to copy the same specifications for the others. There is minimal re-keying of data."

When operators sign on to the system, they first enter their operator number, then their name and finally a six-digit security code. For added security, the last code does not appear on the terminal screen, Ledford said. Southtrust management also uses a feature of Alert/CICS that permits adjustment to the number of days in which security codes are in effect. New codes are periodically presented to operators on-line.

"If security violations do occur," Ledford said, "the software immediately logs information such as the time of day, the originating terminal, the transaction requested and the person who made the error." Security administrators can route this report to appear in real-time on any terminal, he added.

"Alert/CICS has eliminated the desire among Southtrust employees to gain access to transactions via trial and error," he said.

"Aside from violations being recorded on a security report, the software will also shut down a terminal after a specified number of sign-on errors," he said.

The system also shuts down if a predetermined number of violations occur over a 24-hour period, he said. In both cases, only the security administrator can reactivate the CRT.

Not all Alert/CICS security is as tight. In some secure areas, such as inside customer service departments, operators do not access sensitive information.

In those areas, Southtrust can regulate the time of day during which those terminals are open to all department personnel to access specific applications.

"This saves computer resources, eliminates the need for operators to sign on and saves space by eliminating the need to list every operator in a department on the security table," Ledford said.

Today, operators who use Southtrust's on-line network include customer service representatives, programming staff members, data entry operators, technical services personnel, the DP auditing staff, clerks who manage the bank card and mortgage applications and employees in the banking affiliates.

# DayFlo announces a major revision of the fundamental law of computing.





## SOFTWARE &amp; SERVICES

**FLOW** from page 87

passing of the tape is complete.

The result of these physical limitations is that data tends to become terribly conglomerated in the sequential environment. Since the batch designer, for all practical purposes, only gets one shot at the data, the designer wants to do as much as possible to the data once it is in hand.

The functions of creating, updating, deleting, calculating and so forth are done in a single program, thus creating huge batch programs. The data needed to do these functions is accumulated into a few master files. The result of the typical batch sequential design, when spread across several systems, is much duplication of data.

Once the data changes in one

place, it must be changed in all places in which it exists. This need to keep data values current in the face of multiple occurrences of the data is the basis for data flow diagrams. Data flows when it is redundant. For good reason, this is normal in the batch sequential environment. But in the on-line environment, there is no need for data flow, at least in theory.

Data should not exist in more than one place in the on-line environment. But in practice, systems are often built in the on-line environment in the same way they are built in the batch environment, that is, in a piecemeal, unintegrated fashion. So merely going to the on-line environment does not necessarily do away with the flow of data. Data flows even though it is not necessary.

But when the astronomical costs

of duplicate system development and maintenance are considered (and they are as the number of systems grows), then the discipline and backbone for system integration is recognized. Integration, coupled with the on-line environment, is the key to unlocking the promise of on-line systems.

In the on-line, integrated environment, data does not flow. It enters the system, is placed in a single place and is used there until deleted or archived. One test of the adequacy of design of the on-line integration environment is whether data flows or not. If it flows, the design is poor.

But does the fact that data does not flow in the on-line environment mean that data flow diagrams are outdated? The answer is yes, as they are currently represented. A more

suitable analytical technique is to define prerequisite and transformation data for each process. Specifications are indicated in my soon-to-be-published book, *Information Systems Architecture* (Prentice-Hall, Inc., 1985). This specification accomplishes the analytical function of dealing with the commonality and complexity of process design, while at the same time being applicable to a modern, on-line, integrated environment.

Prerequisite data is merely that data which is required to be present in order for a process to execute. Transformation data is that which is changed or has the potential to be changed by the process. Once the process is executed, the next process to be executed is specified. Data does not flow from one process to the other in the on-line, integrated environment.

There is one special case where data flow is appropriate to the on-line environment. That is when data crosses a mode of operation. This might be the operational environment, the decision support environment or the archival environment. As data changes modes of operation, it flows out of necessity. But within the same mode of operation, it does not flow. This is unlike batch sequential systems, which normally require data to flow within the same mode.

In summary, the existing form of the data flow diagram is inappropriate for the on-line, integrated environment. To be useful, processes must be specified with prerequisite and transformation data. Only when designed incorrectly is there a need for data flow in the on-line integrated environment.

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**AIC** from page 87

maintenance of the dictionary on an ongoing basis. The facility reportedly is invoked automatically when an undefined word is entered by a user.

The Lexicon Screen Editor is said to be a tool for building and maintaining lexicons for complex data base applications. Definitions displayed by the Screen Editor can be altered by changing any component of the definition appearing on screen.

An additional feature allowing for global analysis of the lexicon is incorporated in the Screen Editor, which can be invoked at any point in an Intellect session by an explicit command or through an English language query.

The spokesman said Release 301 is the fruit of AIC's efforts to apply artificial intelligence techniques to the building of the lexicon, which had to be explicitly created by data processing personnel with the 200 series of Intellect.

In addition to the Interactive Lexicon Facility, Release 301 features a Report Formatter Facility that reportedly enables users to customize the output format of an Intellect request.

According to the spokesman, Release 301 is currently undergoing alpha testing within AIC and will be ready for beta-site testing within two months.

Release 301 of Intellect running under IBM's MVS and VM operating systems will be priced at \$69,500. A version for IBM's DOS/VSE operating system will be priced at \$49,500, the vendor said.

AIC is based at 100 Fifth Ave., Waltham, Mass. 02254.



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1-800-DIGITAL, extension 700, for the distributor nearest you.

Or write Digital Equipment Corporation, Terminals Product Group, 2 Mt. Royal Avenue, UP01-5, Marlboro, MA 01752.

digital



# COMMUNICATIONS

## Personal computers aid telecom managers in new role

By John Dix  
CW Staff

BOSTON — Telecommunications managers who have been thrust into the role of communications facilities coordinator as a result of the AT&T divestiture can look to their personal computers for help.

A new program released here by Economics and Technology, Inc. (ETI), a publisher of materials concerning telecommunications, is said to enable customers to use their personal computers to examine the costs of variously configured interstate private lines as provided by different carriers.

The program, the first in ETI's newly announced Telecommunications Management Software series, is designed to run on an IBM Personal Computer or Personal Computer XT with at least 512K bytes of random-access memory.

Called the ETI Private Line Pricer, the program is said to use English command prompts to walk users through pricing calculations for point-to-point or simple multipoint interstate private lines.

Carriers, services and tariffs that can

be compared using this program include AT&T Communications, MCI Communications Corp., GTE Corp.'s Sprint, ITT's U.S. Transmission Systems and RCA American Communications, Inc.

The program, which was developed under Ashton-Tate's runtime Dbase II, contains rate and service information about these carriers as well as a data base of 1,700 telephone exchanges, including every city with a population over 20,000, every state capital and every area that serves as a point of interface for long-distance carriers.

These exchanges generate 95% of the nation's long-distance telecommunications traffic, estimated Drew Bottaro, director of publications and information service at ETI. If the data base does not include an exchange in a needed area, users can add up to 700 other exchanges. A manual that comes with the program contains a complete list of all U.S. telephone exchanges.

In practice, users wishing to ascertain the availability and cost of private-line service between any two locations enter the exchange end points and choose the

service type desired. Five types of private-line service are referenced: analog voice, analog data, Dataphone Digital Service circuits up to 9,600 bit/sec, 1.54M bit/sec T1-type digital circuits and voice satellite circuits. Line conditioning options are not included.

Once that information has been entered, carriers to be examined are chosen, and the Private Line Pricer will compute the appropriate routing and pricing components — considering in the process rate elements, service availability, Local Access and Transport Areas and carrier point of interface locations — and display the price comparisons for the various carriers, the company reported.

Depending on how many exchanges are added to the data base by the user, Private Line Pricer can configure and price private lines for as many as one million to three million possible city pairs, a company spokesman said.

An additional feature of the program enables users to create a data base of circuits containing the characteristics of all

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## Teleconferencing eager to prove itself to users



### DATA STREAM

John Dix  
CW Senior Editor

If we were to calculate our location using equipment conferences and the trade press as our sextant and compass, we would probably find ourselves somewhere in the middle of the next decade.

Technology continues to outpace the user, who bustles along ignoring — mostly where appropriate — the incessant knock of new technologies that are waiting at the threshold to be welcomed into his establishment.

One of those technologies pacing in

the foyer is teleconferencing. The technology has been around for years. But both the supply of and demand for teleconferencing services have been lacking. Now, however, the supply side is ramping up, and only time will tell if it can suck demand in behind it.

Teleconferencing is, at the very least, a misunderstood term. Robert Johansen, director of teleconferencing and office systems with the research group of the Institute of the Future in Menlo Park, Calif., says that teleconferencing includes any kind of interactive group communications accomplished through an electronic medium.

The two most common types of teleconferencing are audioconferencing and video/audioconferencing. The simplest

form of the first is conference calling with telephones. The most advanced example of the second is two-way, full motion color videoconferencing. Other types include group audioconferencing conducted from specially designed rooms and slow-scan videoconferencing, which can be similar in effect to a slide show.

The point is, there are enough varieties of teleconferencing to meet the diverse needs of many types of users, but few have ever thought of, let alone ever tried, meeting electronically. Given this, it is tempting to conclude that teleconferencing is a solution searching for a problem.

Perhaps. But Johansen says that the acceptance of teleconferencing has been

See TECH page 106

## AT&T divestiture signals possible savings for federal government

By Lynn Haber  
CW Staff

WASHINGTON, D.C. — For one of the largest telecommunications users in the country — the federal government — the divestiture of AT&T could spell big savings.

The General Services Administration's (GSA) Local Service Department, the group that controls the GSA's local telephone service concerns nationwide, expects to reap benefits from divestiture, particularly in areas related to telecommunications equipment.

During the last few months of 1983, while negotiating a continuity of service agreement with AT&T, Local Service began seeking vendors interested in selling customer premises equipment (telephones, modems, speaker phones and so on).

As a result of that search, Local Service purchased about 250,000 telephones from Bell Atlantic, ac-

*By buying the phones instead of keeping them on lease, as the agency had done in the past, savings of roughly \$40 million would be realized by 1985.*

cording to William Cunname, director of telecommunications for the Local Service program. He estimated that by buying the phones instead of keeping them on lease, as the agency had done in the past, savings of roughly \$40 million would be realized by 1985.

In the realm of switching, Local Service expects that by 1989, the agency will have reaped the benefits of its aggregated switch procurement and consolidation plan that was put in place eight years ago.

That plan outlines when, where and how the agency installs new telephone switching systems. According to Cunname, the GSA maintains and

operates switches around the country, supplying service to government agencies in cities across the U.S.

New switches are being used in a consolidation plan that calls for the GSA to centralize switches to save on overhead, personnel and equipment. Ideally, rather than each agency having its own switch, operators and directory assistance, the GSA switches will fall into 11 regions, with each switch running different consolidated systems in the major cities in the U.S.

There are over 400 switches in the system supporting 550,000 stations, according to Cunname. About 79 out of the 400 switches have been re-

placed in accordance with the plan, and another 24 are in some stage of the procurement cycle.

Based on a 10-year economic analysis, telecommunications savings realized under the consolidation plan may reach 15% to 30%, according to Cunname.

Included in the procurement process is the consideration of some switches that will be able to handle high-speed data transmission. "Depending on the needs of particular agencies, in some cases we will include in our request-for-proposals switches that can handle high-speed data," Cunname said.

The procurement plan began about 1½ years ago, prior to the divestiture. "As a result of the divestiture, we took another look at our procurement plan, and that's when we entered the [continuity of service] contract, because we couldn't be out of a communications system."



## COMMUNICATIONS

VOICE/DATA  
COMMUNICATIONSRACAL-MILGO, INC.  
DSU 500 series

Racal-Milgo, Inc. has announced the Data Service Unit (DSU) 500 series, interface devices used to terminate AT&T Dataphone Digital Service (DDS) networks.

The series operates in full- or half-duplex modes and at switch-selectable data rates of 2,400, 4,800 and 9,600 bit/sec or a fixed data rate of 56K bit/sec. Each model in the series provides front panel operating controls, including those for diagnostics. Local line and remote terminal diagnostics include remote tests, end-to-end tests and loopback tests, accord-

ing to the vendor.

The series includes four units that have internal customer service units (CSUs), which are interface devices required in conjunction with DSUs to terminate a DDS line.

The stand-alone model 500A and a central site unit 500A CS operate at data rates up to 9,600 bit/sec. Models 556A and 556A CS, also available stand-alone or as a central site unit, respectively, have a fixed 56K bit/sec data rate.

Models 500B and 500B CS operate at data rates up to 9,600 bit/sec and require use of a separate CSU interface. Models 556B and 556B CS also require a separate CSU and operate at a fixed data rate of 56K bit/sec.

Pricing of the models depends upon configuration, starting at \$995 for Models 500A and 500B, \$1,050

for Model 556A and \$850 for Model 556B.

*Racal-Milgo, 8600 N.W. 41st St., Miami, Fla. 33166.*

WESTERN UNION CORP.  
Private-line voice and data service

Western Union Corp. has announced plans to offer private-line voice and data service between the U.S. and UK, in conjunction with Mercury Communications Ltd., a UK company. The service, scheduled to begin Aug. 1, is pending Federal Communications Commission review.

Initially, the service will be offered between New York and London on a private-line basis over channels obtained by Western Union from Communications Satellite Corp. and by Mercury from International Tele-

communications Satellite Organization, a transoceanic satellite carrier. Eventually the service will be provided on a shared private-line basis, a company spokesman said.

Usage rates for the service will vary according to time of day.

*Western Union, One Lake St., Upper Saddle River, N.J. 07458.*

PROTOCOL  
CONVERTERSCOMPUTER PERIPHERAL  
SYSTEMS, INC.  
Mars Jr.

Computer Peripheral Systems, Inc. has announced Mars Jr., a protocol converter that is said to be able to connect any asynchronous TTY-type terminal with an RS-232 interface with a Burroughs Corp. network using that vendor's poll select protocol.

The device has two user-programmable ports that can be reconfigured by program-dip switches on the unit, or the configuration can be downloaded from the host or uploaded from a terminal, according to the vendor.

The basic unit costs \$795.

*Computer Peripheral Systems, P.O. Box 98282, Atlanta, Ga. 30359.*

MULTIPLEXERS/  
MODEMSTELEPROCESSING PRODUCTS,  
INC.TP-400 Polling Statistical  
Multiplexer

Teleprocessing Products, Inc. has announced the TP-400 Polling Statistical Multiplexer.

The TP-400 is a closed X.25 packet switcher that uses an 8-bit microprocessor and includes such programming techniques as virtual memory and algorithm for error control and overbooking, the vendor said.

The product is controlled through a port that allows access either locally or remotely by any Ascii display terminal for management control.

The price for an eight-port unit is \$1,400.

*Teleprocessing Products, Building 7K, 4565 E. Industrial St., Simi Valley, Calif. 93063.*

CODEX CORP.  
2360

Codex Corp. has introduced the 2360, a 14.4K bit/sec modem that the vendor claims works better than first-generation modems of this variety. The increased performance is attributed to the combined implementation of a custom very large-scale integration chip set and a Motorola, Inc. 68000 microprocessor.

The modem, designed to support high-speed point-to-point applications, can be configured to operate using Trellis Coded Modulation or CCITT V.29 modulation at data rates from 4,800 to 14,400 bit/sec, the vendor said.

The product features a standard control panel which enables the operator to configure, monitor and test the modem. Diagnostic tests include modem check, digital loopback, terminal loopback and self-test.

An integral four- or six-channel

Continued on page 104

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5080 Spectrum Drive, Dallas, Texas 75248



## COMMUNICATIONS

Continued from page 102

multiplexer is optional. Available now, the modem costs \$8,750.

*Codex, 20 Cabot Blvd., Mansfield, Mass. 02048.*

### COMPUTER PERIPHERAL SYSTEMS, INC. Overdrive

Computer Peripheral Systems, Inc. has announced Overdrive, a new feature for its Ex-Con product that extends the operational distance of Burroughs Corp.'s Two-Wire Direct Interface (TDI) a factor of five or 10 times, the vendor claimed.

Overdrive allows distances of 5,000 ft at 19.2K bit/sec and 8,000 ft at 9,600 bit/sec to be spanned, the vendor said. This compares to the distance limitations of Burroughs'

TDI of 500 ft and 1,000 ft at the same speeds.

The feature will become standard on the company's Ex-Con product line, costing \$225. Installed Ex-Cons can be factory upgraded with the new feature for a cost of \$50.

*Computer Peripheral Systems, P.O. Box 98282, Atlanta, Ga. 30359.*

### LOCAL-AREA NETWORKS

**TCL, INC.**  
A0007-Etsi

TCL, Inc. has announced an Ethernet transceiver signal indicator (Etsi) that is designed to aid field service

personnel in troubleshooting Ethernet-type, IEEE 802.3 local-area networks.

Designated part number A0007-Etsi, the signal indicator contains four LEDs (one each for power, transmit, collision and receive signals) that continuously monitor and indicate the status of the network.

The indicator has a 15-pin connector and is inserted in series with the transceiver (known as a Medium Access Unit or MAU under the 802.3 standard) and cable. Lights on the device indicate an adequate power supply, possible short circuits on the coaxial cable, collisions, continuous transmission and open circuits between the transceiver and the cable.

The price is \$149.95.

*TCL, 41829 Albrae St., Fremont, Calif. 94538.*

## AUXILIARY EQUIPMENT

**TELEAUTOGRAPH CORP.**  
Omnifax G99

Teleautograph Corp. has introduced the Omnifax G99, a business facsimile compatible with CCITT groups 1, 2 and 3.

The product features mark-sense dialing cards, operates at 9,600 bit/sec, has automatic reduction and features switch-selectable automatic cut, the vendor said.

The price of the facsimile is \$6,000.

*Teleautograph, 8700 Bellanca Ave., Los Angeles, Calif. 90045.*

**HUGHES AIRCRAFT CO.**  
9300HA series

Hughes Aircraft Co. has announced the 9300HA series of redundant control units for uplink amplifiers used in satellite communications.

The series is said to provide fully automatic monitoring and switching for redundant operation of two or more high powered amplifiers.

Internal logic initiates appropriate radio frequency switching upon sensing faults in amplifier output, power supply, user system faults, or missing data pulses.

The price of the base system is \$8,400.

*Hughes Aircraft, 3100 W. Lomita Blvd., Torrance, Calif. 90509.*

**TELECOMMUNICATIONS PRODUCTS, INC.**  
Model 4001 Interface Unit

Telecommunications Products, Inc. has announced the Model 4001 Interface Unit, a device designed to enable credit authorization terminals to be connected to a variety of host computers.

The device, used in conjunction with Bell or compatible 103 or 212A type modems, enhances data, adding and deleting control characters where needed to enable credit authorization terminals to communicate directly with host computers.

The interface is adopted to the user's hardware, compensating for the ways various computers initiate and terminate communications sessions, a company spokesman said. The device costs \$360.

*Telecommunications Products, 8141 W. 1-70 Frontage Road N., P.O. Box 1205, Arvada, Colo. 80001.*

## CONTROLLERS

**ALC NETWORK SYSTEMS**  
Memory module

A new memory module that reportedly doubles the memory capacity of the IBM 3705 communications controller was announced recently by ALC Network Systems. Adding the memory module to the IBM 3705 gives the controller the performance capabilities of an IBM 3725-1 or 3725-2 at a fraction of the cost, the vendor claimed.

ALC offers its memory module in two models: Model 710, which increases the 3705's memory capacity to 512K bytes; and the Model 720, which adds a full megabyte of memory to the IBM 3705. Each model fits into the 3705 enclosure and obviates

Continued on page 106

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increasing your developers' productivity and accelerating your time to market. These tools include a screen-based forms manager, a relational DBMS with end-user access, and an application system manager.

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Learn more about Eternity by contacting Shirley Henry, Director of Marketing, Tolerant Systems, Inc., 81 East Daggett Drive, San Jose, CA 95134, (408) 946-5667, TELEX 278860.



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## COMMUNICATIONS

Continued from page 104

the need for an IBM 3706 Expansion Frame.

Reportedly, IBM has certified the 3705 with an ALC memory module as acceptable for maintenance, meaning that customers can retain IBM maintenance.

Until now, users that wanted to expand the memory capacity of their 3705s beyond 256K bytes had to install a 3706 Expansion Frame. The ALC Module increases the controllers' memory from 256K bytes to 1M byte without requiring the addition of a 3706.

The vendor claimed that a 3705 equipped with an ALC Model 710 provides the equivalent memory and 2.5 times the line capacity of a 3725-2 and costs 65% less than that unit. Additionally, a 3705 with a Model

710 gives the device a full megabyte of memory at 60% of the price of a comparably configured 3725-1 with 64 lines.

ALC's service organization, which is said to specialize in the IBM 3705, will install the ALC Memory Module in accordance with IBM's policy covering customer-owned additions to its equipment.

The ALC Model 710 and 720 modules are available for purchase and lease. The Model 710 costs \$15,000 and can be rented for \$1,075 per month on a one-year lease and \$805 per month for two years.

The 720 costs \$20,000 and can be rented for \$1,230 per month for one year and \$1,005 per month for two years.

ALC Network Systems, 985 University Ave., Los Gatos, Calif. 95030.

## ETI from page 101

the private lines in a system. As tariffs change, the user can reprise his lines to gauge the effects of the change and perform analysis of alternative configurations, comparing the rates of different carriers.

The Private Line Pricer is offered on a subscription basis, with updates including rate changes, new services, new carriers, carrier availability and changes to rate structures.

A one-year subscription to Private Line Pricer is presently available for \$2,500 and includes the initial program and monthly updates. Additional program subscriptions cost \$2,000 each. An overnight delivery option for the updates costs \$150.

ETI is located at 101 Tremont St., Boston, Mass. 02108.

## TECH from page 101

hampered by users' misconceptions of what the technology can and cannot do. One of the fundamental misconceptions, he indicated, is the view of teleconferencing as a technology to save time and money, particularly in travel.

While those indeed may be attractive factors, Johansen said that instead of thinking of teleconferencing merely as a substitution for travel, the technology should be viewed as a corporate asset, one that can be employed to make the company money.

This, apparently, is not a way of thinking that has caught on, particularly with video teleconferencing. Johansen estimated that there are roughly 25 conferencing facilities or rooms equipped with two-way, full motion video equipment today. There are another 100 facilities that have slow-scan video capabilities.

Some of these facilities are privately owned and operated, and some are operated as public facilities by the service suppliers. The number of sites of both types is expected to grow dramatically this year.

One company, ISA Communications, Inc. (Isacomm), a unit of United Telecommunications, Inc., said it hopes to install 40 video teleconferencing rooms by the end of the year, 20 of them in the next four to six months. Tony Zalenski, senior vice-president and general manager of Isacomm's videoconferencing group, said that the company has six conferencing rooms installed today.

Isacomm is marketing private and shared video teleconferencing facilities to Fortune 500 companies and is trying to persuade major real estate developers to install rooms that they could, in turn, use to attract tenants. Real estate developers that opt to install facilities would also be able to offer the service to the surrounding community and glean a percentage of the revenues the room generated.

Other major players in the video teleconferencing market include AT&T and Satellite Business Systems. Late last month, AT&T proposed new tariffs to the Federal Communications Commission for its Accunet Reserved 1.5 service that the company said is used primarily for video teleconferencing. The new rates would reportedly reduce charges an average of 25% and establish a 40% discount period for weekends and some weekday hours.

AT&T reported that it operates 11 public conferencing rooms and noted that Hilton Hotels Corp. recently announced that it plans to install a network of 35 public rooms for two-way videoconferences.

Satellite Business System's video teleconferencing efforts have been, for the most part, restricted to providing private networks to such companies as Aetna Life and Casualty Co., J.C. Penney and IBM. However, it is opening some of its personal facilities to the public.

## The missing link between the IBM graphic system and the Hewlett-Packard Plotter.



Anybody working with IBM graphics knows the inconvenience when multi-color screen displays are to be transferred to paper and foils.

Now, you can solve that problem with a Maersk Data MD-PLOT. A program giving the users of the IBM graphic system the opportunity to plot on a high quality Hewlett-Packard Plotter. And thus have the graphic displays from the IBM mainframe printed in as much as 8 colors. On paper or foils in A3/B or A4/A. In bar charts, graphs or pie charts.

The MD-PLOT makes it easier to get an overall picture. Due, quite simply, to the more distinguished representation. Whether it is ordinary business graphics or illustrations for education and teaching.

The MD-PLOT program can be attached to the corporate IBM mainframe thus making it possible for several plotters to utilize it. Each plotter can be linked to the network of terminals via a box (a protocol con-

verter), just as if it was a standard IBM printer.

The MD-PLOT is compatible with the IBM main-frame systems 43XX and 30XX. The plotter is a Hewlett-Packard 747X A or 7550 A. The MD-PLOT is a program collecting the output files from the IBM graphic system (GDDM) and converting them into the HP plotting commands. The converted print file can be transferred to the plotter via a spool system. All the GDDM applications, e.g. the Chart Utility, the Graphpak, and the PGF, are compatible with the MD-PLOT.

No further training is necessary for using a plotter instead of an ordinary graphic printer.



**MAERSK DATA**

One World Trade Center, Suite 3527, New York, New York 10048, U.S.A., Phone (212) 432-8413, Telex 42 03 72.  
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# SYSTEMS & PERIPHERALS

## DG adds two models to workstation series

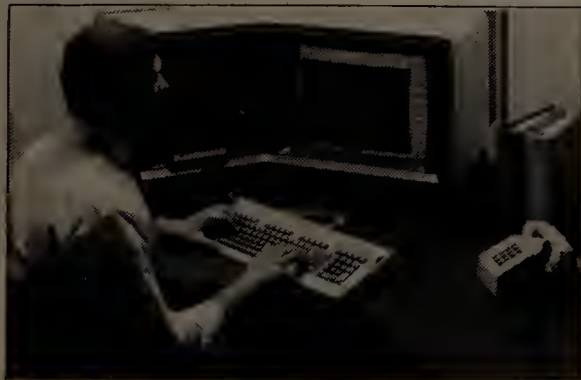
By Tom Henkel  
CW Staff

WESTBORO, Mass. — Data General Corp. recently expanded its line of engineering-oriented workstations with two models, the GW/10000 and GW/8000. The units are based on the firm's Eclipse MV/10000 and MV/8000 II superminicomputers.

As part of the same May 2 announcement, DG announced the GD/1000, a graphics display subsystem, and AOS/VS Graphics Kernel System (GKS) Level 2B, a programmer interface for graphics applications. The software replaces the firm's earlier Level 0B software.

The GW/10000 and GW/8000 are packaged engineering graphics systems that extend the line of graphics workstations announced by DG in March 1983. The original workstation, called the GW/4000, is now the entry-level product in the GW line, a spokesman said.

Said to be capable of internal performance of up to 2.5 million instructions per



Data General's GW/8000, GW/10000 graphics workstations.

second, the GW/8000 and GW/10000 feature two monitors — a 19-in. color graphics display that features a 1,280- by 1,024-pixel resolution and a DG Dasher D460 alphanumeric monitor with a low-end graphics capability.

Designed to support compute-intensive interactive operations such as modeling, seismic analysis and geophysical image processing, the workstations can be

linked, via DG's Xodiac communications software, to other DG systems and to systems using IBM's Systems Network Architecture, the vendor said.

Each system includes either the MV/8000 II or MV/10000 CPU and can support up to four separate design stations. The systems include DG's GDC/1000 graphics controller and the GKS Level 2B programmer's interface and the firm's AOS/VS operating system, the vendor said.

A basic configuration of the GW/10000, including 2M bytes of main memory, a 354M-byte disk drive and a dual-mode magnetic tape drive, the GDC/1000 graphics controller, the firm's AOS operating system and the GKS Level 2B software, costs \$277,900. A GW/8000 with 2M bytes of main memory, a 354M-byte disk drive, a dual-mode magnetic tape drive, the AOS operating system and GKS Level 2B software costs \$160,500, DG said.

Also announced was the GD/1000 graphics display subsystem. The unit com-

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## Parallel announces fault-tolerant, Unix-based mini

SANTA CRUZ, Calif. — Parallel Computers Co. recently announced the Parallel 300, a fault-tolerant minicomputer which the firm claims can be repaired without special training or tools by the end user.

Aimed primarily at OEMs and systems integrators, the Parallel 300 uses the University of California at Berkeley's Unix Version 4.2 and is meant for use in factory automation, office automation and engineering workstation networks and other applications that require high system availability.

A company spokesman said the system is available to end users, but the firm sells only the CPU and integrated peripherals, such as redundant disk drives. Users must configure the system with their own CRT terminals. The spokesman added that the system can make use of most applications

developed for the Unix operating system without modification.

The system is based on two closely coupled Motorola, Inc. 68010 microprocessors, which are said to execute all tasks simultaneously. It offers roughly the same internal performance as Digital Equipment Corp.'s VAX-11/750 or Data General Corp.'s MV/4000 processors and supports up to 16 users.

The Parallel 300 comes with a standard 1M byte of user-addressable main memory, which is expandable to 4M bytes. However, the main memory is duplicated within the Parallel 300, so the standard main memory is actually 2M bytes, expandable to 8M bytes, and the user can only address half of the actual main memory. Likewise, user-addressable hard disk storage ranges from 80M- to 640M bytes, according to the

vendor spokesman.

All parts in the Parallel 300 system can reportedly be replaced without tools or specialized training. In the event of a component failure, the processor alerts the user to the nature of the problem and provides step-by-step instructions for replacing the faulty component. A fault indicator light on the cabinet indicates a system failure, and lights inside the cabinet light up when the module is in need of replacement. In addition, a message is sent to the system console and to the disk drive, where an entry is made in a permanent error log, the spokesman said.

The company is offering a toll-free number for users to call for replacement parts. The spokesman said parts will be sent out via an overnight carrier.

See MINI page 111

## Floating Point Systems expands FPS-164 scientific processor line

BEAVERTON, Ore. — Floating Point Systems, Inc. has announced an addition to its FPS-164 scientific computer family, a special-purpose supercomputer boasting peak performances ranging from 33 to 341 million floating-point operations per second (Mflops).

The FPS-164/MAX is designed for use in structural analysis, computational chemistry and physics, semiconductor physics and electromagnetic modeling.

Existing FPS-164 machines can be upgraded with modifications that include addition of MAX boards.

The FPS-164/MAX hardware is said to be especially suited for high-speed performance of key matrix operations such as dot products, matrix to matrix multiplication and matrix factoring.

The company said that the FPS-164/MAX can compute up to 124 vector operations at one time, allowing a

fully configured FPS-164/MAX to factor a 1,000- by 1,000 floating-point number matrix in about one second and to multiply two 10,000- by 10,000-floating-point number matrices in less than an hour. It also is said to feature the scalar capability of the original 64-bit FPS-164.

A typical configuration, designed to run 33 Mflops using a single MAX board, is priced at about \$450,000, with 4M bytes of internal memory, 16K words of table random-access memory, FPS' Program Development Software, a Fortran compiler, FPS' System Job Executive operating system and FPS' D64 Disk Subsystem, including two 14-in., 135M-byte formatted Winchester disk drives.

The FPS-164 is available now and can be updated when the MAX board is delivered in late 1984.

Floating Point Systems can be reached through P.O. Box 23489, Portland, Ore. 97223.

## College incorporates graphics into several class programs

TEMPE, Ariz. — Arizona State University here has incorporated computer-generated graphics into several of the school's educational programs, including engineering and architecture.

Several programs are under way at the 40,000-student institution to provide computer graphics instruction. Many of those projects are being conducted on a Harris Corp. Harris 800 48-bit superminicomputer using a software package developed by Manufacturing and Consulting Services, Inc. entitled Anvil 4000.

For example, instruction using the Harris processor and the Anvil 4000-based graphics package is taking place in the university's college of engineering. One undergraduate engineering course uses the program to give students an introduction to computer-aided design and manufacturing; another uses it to teach computer-assisted drafting; and a junior-

level class in technical illustration uses it for project modeling.

Universitywide, as many as 3,500 students have had at least some exposure to computer graphics, noted James H. Howard, the university's manager of computer graphics support. Howard's academic computing services department serves students and faculty, including those in the engineering department, who do not have access to specialized departmental computing resources. It handles, according to Howard, roughly 2,000 computer graphics accounts per term, most of them for undergraduates doing course work.

Other graphics packages in use at Arizona State are DI 3000, Grafmaker, Contouring and Metafile Translator, all developed by Precision Visuals, Inc. They all run on the Harris 800, which was purchased by the school at an educational discount

See GRAPHICS page 111



## SYSTEMS &amp; PERIPHERALS

TURNKEY  
SYSTEMSCOMPUSCAN, INC.  
Formsreader

Compuscan, Inc. has announced an optical character reader-based data entry system designed to transmit typed, marked and hand-printed numeric data directly from preprinted business forms to a computer.

Formsreader is said to offer reading and validating capabilities that can be tailored by the user to suit various forms. Forms for time and billing, payroll, inventory, tax assessments, medical records, insurance records, personnel records, market research, sales call reporting and other purposes can be read and verified, according to the vendor.

The system consists of Compuscan's Alpha Word III-Plus page reader, a microcomputer with a 24-line CRT, dual floppy disk drives, a detached low-profile keyboard, a console printer, an interface to a host computer or peripheral and Compuscan's Formsreader software.

According to the company, the user can create forms and can program the system to read certain fields of data and skip others. The system includes a menu, which allows the user to set up new applications in less than an hour, the company said.

Formsreader is said to operate in conjunction with mainframes and minicomputers from IBM, Digital Equipment Corp., NCR Corp., Hewlett-Packard Co., Sperry Corp., Datapoint Corp., Burroughs Corp., Tandem Computer, Inc. and others.

The system costs \$39,400 and is available under lease plans of up to five years.

Current Alphaword III-Plus installations can be upgraded with Formsreader capabilities for \$9,900, exclusive of installation, training and forms design.

Compuscan, 81 Two Bridges Road, Fairfield, N.J. 07006.

## PROCESSORS

IMAGITEX, INC.  
Imagix

Imagitex, Inc. has introduced an expanded set of software and hardware features for its Level 3 black-and-white image processing subsystem.

Imagix is an interactive image processing system comprising the vendor's Model 1085 digitizer scanner, two intelligent disk controllers with 35M bytes of on-line storage, a color display workstation and the vendor's software operating with Motorola, Inc.'s 68000 microprocessor and Charles River

Data Systems, Inc.'s Unos operating environment.

The software reportedly has been enhanced to enable electronic merging of graphics with text. Other enhancements are postprocessing and data formatting functions for the Information International, Inc. Comp 80 and Video-comp typesetters, as well as the Monotype, Inc. Laser-comp Mark II typesetter, a vendor spokesman said.

The system is priced at

\$115,000.

Imagitex, 77 Northeastern Blvd., Nashua, N.H. 03062.

## DATA STORAGE

ZETACO DIVISION,  
CUSTOM SYSTEMS, INC.  
ZDF-1

Zetaco, the controller division of Custom Systems, Inc., has announced the ZDF-1

disk and tape controller.

This product is a dual-function controller compatible with Data General Corp.'s Nova and Eclipse series minicomputers. It features emulation of DG 6021, 6060, 6061, 6067, 6122, 6125, 6160 and 6161 tape subsystems, according to a spokesman.

ZDF-1 provides compatibility on systems running under DG's Rdox and AOS operating systems. The product eliminates on-board switch-

es, allowing drives to be configured from the operator's console.

Data transfer rates of up to 2M byte/sec on disk drives and up to 1M byte/sec on tape drives are supported, according to vendor spokesman.

The ZDF-1 is priced at \$4,195.

Zetaco Division, Custom Systems, 6850 Shady Oak Road, Eden Prairie, Minn. 55344.

## On IBM® PC compatibility, the portable computer, and you.

### What is IBM PC compatibility and why is it important in a personal computer?

IBM PC compatibility refers to a computer's ability to perform like an IBM Personal Computer. Its importance can be explained in one word: software. You see, the overwhelming success of the IBM PC has created a booming IBM compatible software industry. As a result, some of the most advanced and innovative software packages available today have been written specifically for the IBM PC. So no matter what your business problem, it is most likely that the software to solve it already exists. But only a truly IBM PC compatible computer can take immediate advantage of these hundreds of state-of-the-art programs. As well as future IBM PC software breakthroughs.

### Why are some computers more compatible than others?

IBM PC compatibility can be a very relative term.

For example, a computer featuring the same 8088 microprocessor as the IBM PC, but without the necessary compatible disk operating system is not IBM PC compatible. Nor are computers advertised as IBM compatible that use 3 1/2" floppy disks (the IBM PC's are 5 1/4") or magnetic bubble memories. While these computers claim IBM PC compatibility, they will not run software written for the IBM PC without modification.

To make certain of a system's IBM PC compatibility, see if it can run popular software written for the IBM PC: Business programs like Lotus 1-2-3™, VisiCalc™, or WordStar™. Games like Flight Simulator™. Or educational software from Spinnaker™.

For true compatibility, you need a computer that can run all this IBM PC software right off the shelf. A computer like the Visual Commuter.™





## SYSTEMS &amp; PERIPHERALS

PRINTERS/  
PLOTTERS/  
PERIPHERALSDATA GENERAL CORP.  
GPS

Data General Corp. has announced the Dasher General Purpose System (GPS) dot matrix printer, a tabletop printer for medium-duty line printing and graphics applications.

The Dasher GPS printer is available in two models. Model 6215 is a serial interface printer. Model 6216 is a parallel interface printer compatible with DG's line printer controllers. Both models feed paper at a maximum rate of 10 in./sec, according to the vendor.

The printer is code-compatible with DG printers and responds to Ansi X3.4, X3.41 and X3.64 standard codes. The graphics modes feature

four densities on horizontal and vertical planes in a nearly square matrix.

The Dasher GPS' programmable functions include character set and pitch, form setting, tab setting and underscore. It can print from 80 char./line up to 136 char./line when printing 10 char./in. and has 11 foreign-language character sets, according to the vendor.

The Dasher GPS Model 6215 is priced at \$2,995 and

the Model 6216 at \$2,950, the vendor said.

*Data General, 4400 Computer Drive, Westboro, Mass. 01581.*

MDB SYSTEMS, INC.  
Line printer controller  
package

MDB Systems, Inc. has announced a line printer controller package for Digital Equipment Corp.'s Q-bus computer systems. It is said

to allow DEC and MDB Micro/11 computers to be upgraded with conventional line printers and still comply with Federal Communications Commission frequency-emission standards.

Each package consists of a base line printer controller module, a 30-in. internal cable and a bulkhead-mounted interface adapter board.

The cost of each package is \$510 in single quantities, the vendor said.

*MDB Systems, Box 5508, 1995 N. Batavia St., Orange, Calif. 92267.*

## POWER SUPPLIES

NOVA ELECTRIC  
MANUFACTURING CO.  
800-VA

Nova Electric Manufacturing Co. has announced an 800-VA addition to its Supernova Power Conditioner/UPS series.

The 800-VA unit is said to offer twice the power of its 400-VA predecessor.

According to the company, Supernova is a sine-wave uninterruptible power supply operating in forward transfer mode. It was designed for use with microcomputers, private branch exchange systems, word processors, cash registers, automatic weighing and counting systems and bank teller terminals.

The 800-VA system is priced at \$890.

*Nova Electric, 263 Hillside Ave., Nutley, N.J. 07110.*

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If you've ever lugged around a 35 pound computer with a handle, you'll appreciate the beauty of Commuter's design. At only 16 pounds (about half the weight of other portables in its class), Commuter has solved the weight problem that has plagued other full-function portables. Whether at work, home, or on a business trip, with Commuter you're travelling light. And at only 3 1/2" x 18" x 15" with built-in handle and carrying case, you can take it anywhere you can take a briefcase.

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For more information, call **1-800-847-8252** (in MA call **1-800-462-5554**), or write Visual Computer Incorporated, 135 Maple Street, Marlboro, MA 01752. Or visit your local Commuter dealer today.

***Commuter. It can take your business places it's never been.***

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## NAMEWARE

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Stamford, CT  
Voice/data telephones  
(Formerly Digital Transactions)

**COGNOS**  
Ottawa, ONT  
Business/financial software  
(Formerly Quasar Systems)

**COMPAQ**  
Houston, TX  
Portable computers  
(Formerly Gateway Technology)

**COMPATH**  
Oakland, CA  
Business telephone systems  
(Formerly Scott-Buttner)

**DATAGO**  
New York, NY  
Computer stores  
(New venture of NYNEX)

**DAYFLO**  
Costa Mesa, CA  
Software for IBM PC  
(Formerly Gilchrist Software)

**ECZEL**  
San Francisco, CA  
Computer supplies  
(New venture of CrownZellerbach)

**MINDSET**  
Sunnyvale, CA  
Home computers  
(Formerly RHB Computers)

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One of the advantages of Stratus' hardware based approach to fault tolerance when it was introduced 2 years ago was that, unlike software based fault tolerant computers, it required no added attention from programmers or users. This is just as true now for the powerful new Stratus XA computers. Even the XA 400 with 4 parallel processors, and the XA 600 with 6 parallel processors, high speed cache memories, and additional hardware instructions require no more effort from developers and



XA 400



XA 600

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## SYSTEMS &amp; PERIPHERALS

## GRAPHICS from page 107

shortly after the Anvil 4000 program was donated to the university by an alumnus.

The Arizona State geography department uses the Contouring package for mapmaking, Howard said, and is also using computer graphics for image analysis surveys of data sent back by the Landsat satellite. Computer graphics capability is especially important for geography students, Howard said, because "most companies who hire geography students use computers these days."

Two other computer graphics packages in use at Arizona State are Swanson Analysis Systems, Inc.'s Ansys and the National Aeronautics and Space Administration's Rim; the former for stress analysis, the latter for operation of relational data bases. At present, Ansys is being used by graduate students in the school's civil engineering department to place load factors on architectural designs. The Rim program, meanwhile, is used for energy-use analysis by the architecture department and allows users to model construction projects "working from the very beginning of a plan all the way up to a presentation," Howard said.

Architecture students are also using a graphics program developed in-house, called Sunray, to model the effects of the shadow thrown by a proposed structure. Many cities, Howard noted, ban buildings that eclipse their neighbors.

The computer group's Harris 800 is directly linked with 25 terminals and, via six dial-up ports, can be connected to any terminal on campus. Also connected to the Harris 800 are six modems, an 11-in. printer/plotter, one tape drive, two 300M-byte disk packs and an eight-color plotter.

The number of peripherals attached to the computer makes it somewhat unique, Howard explained, since industrial graphics users often have only a few graphics terminals and one hard-copy device. It was the capacity of the Harris 800 that netted the firm a contract with Arizona State, Howard said.

"When we tested it, the Harris machine ran 14 simultaneous terminals with Anvil [4000], which is a very large program," he explained, "We could have run more, but we just didn't have more than 14 graphics terminals then."



'First, I'll tell you the good part. See the little plug on the end of this cord? It's OK.'

## DG from page 107

bines the firm's GDC/1000 graphics controller and a graphics monitor. The unit was developed for users who want to expand their graphics systems with additional workstations. The GD/1000 contains all the packaged graphics hardware included in the GW family systems, but does not include a CPU. When connected to an MV or GW family system, the GD/1000 adds an additional workstation to an existing engineering environment, a spokesman said.

The GD/1000 can be connected to the host processor via a data channel operating at 2M byte/sec. Users can reportedly attach the device to their systems without experiencing a significant decrease in performance.

The GD/1000 costs \$36,000, the

vendor said.

Lastly, DG enhanced its systems software for the GW line of engineering workstations with AOS/VS GKS Level 2B. The enhanced software provides two basic enhancements over the earlier Level 0B release. It provides capabilities for workstation-independent segment storage and metafileing, the vendor said.

Workstation-independent segment storage allows programmers to combine graphics primitives and manipulate them as a unit. Metafileing allows users to file and store graphics images on the system disk drive.

The Level 2B software costs \$1,600, including the initial license, installation and one year's software service and maintenance.

DG is located at 4400 Computer Drive, Westboro, Mass. 01580.

## MINI from page 107

The Parallel 300's architecture duplicates all vital components, including processors, disk drives, disk controllers and power supplies.

Either of two duplicated power modules, each with integrated batteries, can power the system. The firm said the backup power can run the system for up to 15 minutes after a failure.

In the event of an extended power loss, the system will automatically shut itself down while safeguarding the data.

A basic configuration costs \$74,900 with discounts offered to OEMs.

Parallel Computers is located at 3004 Mission St., Santa Cruz, Calif. 95060.

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# MICROCOMPUTERS

## System software upgrades near commercial use: officials

By Eric Bender  
CW Staff

PHOENIX — Several major enhancements for personal computer systems software are nearing commercial introduction, officials from the two leading developers of microcomputer operating software maintained late last month.

Among product plans, Digital Research, Inc. expects to ship "our answer to [VisiCorp's] Vision, [Microsoft, Inc.'s] Windows and Apple [Computer, Inc.] microcomputers" by mid-November, said Fred Langhorst, director of corporate planning and development.

Speaking here at International Data Corp.'s 1984 Spring Executive Conference, Langhorst said that the Palo Alto, Calif., company's new Crystal package will be something like "generic Macintosh" software, with functions similar to those in the Macintosh 64K-byte, read-only memory chip.

Designed to simplify the user interface for varied applications, Crystal will include an applications manager, a version of the company's GSX graphics software and other functions, Langhorst said. He added that Crystal will work with existing applications running under the firm's multitasking Concurrent DOS or Microsoft's MS-DOS operating systems.

Langhorst also emphasized the potential importance of multitasking capability. As systems built around new microprocessors, such as the Intel Corp. 80286, become available, desktop machines will have enough power to "have things working in background without even knowing it," he said.

Multitasking benefits, such as the ability to receive or send messages without stopping work on another job, will become routine, Langhorst predicted. "A few years from now, we'll wonder how we

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### SMALL TALK

Eric Bender  
CW Senior Editor

## All-in-one idea not for everyone

Everyone advertises software as user-friendly, although many products still intimidate users or insult their intelligence. Everyone talks about product support, although most hot lines still ring for minutes. Beyond that, however, there's precious little agreement among microcomputer software vendors.

This arrangement is wonderful for reporters, who can easily call up a dozen experts, listen to them explicitly contradict each other and write the balanced stories that editors love. But those who actually buy the software face a confusing maze of opinions, and the situation is not necessarily getting any easier.

Take a look at the debate on all-in-one integrated software, which began almost two years ago when Context Management Systems introduced Context MBA, the first major all-in-one package. This spring, some big players are introducing a second wave of multifunction packages, but other leading vendors still say that single-function products will prevail.

Lotus Development Corp., the most successful software startup in history, blossomed on the strength of its 1-2-3 package, whose three main components are spreadsheet, data manager and graphics. The company's commitment to all-in-one packages is further strengthened by Symphony, its second major entry, which will add full-featured word processing, communications and other enhancements.

However, Fred Gibbons, president of another highly successful software ven-

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## Users share letter-quality printers

By Paul Korzeniowski  
CW Staff

Corporate microcomputer users who desire letter-quality printers or plotter output usually must walk to another system to produce it, according to MIS managers interviewed recently by *Computerworld*.

Companies will readily supply a user with a dot matrix printer, but letter-quality printers and plotters are difficult to justify, managers said. These devices are more expensive (with prices starting at approximately \$600) and produce either letter-quality or graphics output, while dot matrix printers generate both types of output.

While dot matrix printers are typically included with each microcomputer purchase, letter-quality printers are shared

among users. "We have a plotter, a letter-quality printer and a graphics monitor shared among our users," said Martin Maney, DP manager at the Fairbanks Morse Division of Colt Industries, Inc. in Kansas City, Kan. This arrangement provides the output that users need, but time is wasted walking to and from the microcomputer.

"To use his personal computer for word processing, one of our managers would have to hand the output to his secretary so she can type it or carry the disk to a microcomputer with a letter-quality printer," said Ronald Goldfarb, manager for office automation at Pratt & Whitney Aircraft in Hartford, Conn.

While Pratt & Whitney has installed

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## A.B. Dick enters supermicro market with Knowledge Worker

By Tom Henkel  
CW Staff

CHICAGO — A.B. Dick Co. last week threw its hat into the supermicrocomputer arena as it introduced the Knowledge Worker, a system based on Intel Corp. 80186 and Motorola, Inc. 68010 microprocessors.

Manufactured by Convergent Technologies, Inc. for A.B. Dick, the system can function either as a stand-alone unit or in a cluster of up to 127 workstations. Each station is capable of storing 1.2M to 80M bytes of data. Clustered systems can store up to 21G bytes, the firm said.

The Knowledge Worker features M-Path, A.B. Dick's icon-based operating system, which reportedly allows users to create their own mix of business tools such as documents, files, in/out trays and spreadsheets. A.B. Dick claimed the M-Path software provides a single icon-driven user interface for all applications software.

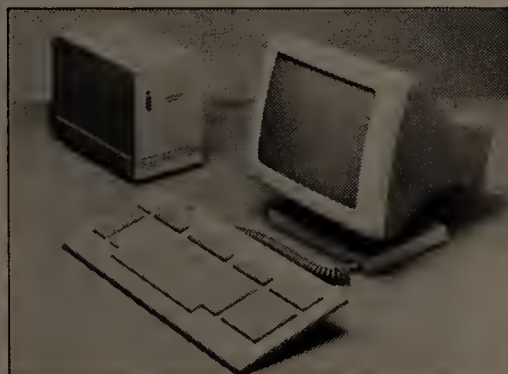
In addition, the system supports



A.B. Dick travels from mimeograph to microcomputer

four operating systems: Digital Research, Inc.'s CP/M 86; Microsoft, Inc.'s MS-DOS; and Convergent Technologies' Ctos and Ctix, that vendor's version of Bell Laboratories' Unix Version V operating system.

The Knowledge Worker is said to be compatible with the Ethernet local-area network and Convergent Technologies' CTnet wide-area network. The supermicro also can use A.B. Dick's communications products to operate in IBM Systems Network



Architecture environments.

The Knowledge Worker is equipped with 265K bytes of random-access memory (RAM) and has slots available for three additional 256K-byte RAM cartridges, the vendor said.

A basic Knowledge Worker system costs \$8,800, including a 12-in., 720-by 348-pixel monochrome monitor, detachable keyboard, central processor with 512K bytes of RAM and support for two RS-232C ports, an RS-

422 port and a parallel printer port with a Centronics Data Computer Corp.-compatible interface. Also included are a power supply, a 10M-byte hard disk drive and a 630K-byte floppy disk drive, the firm said.

Options include a graphics controller to support bit-mapped graphics (which costs \$1,300) and a 720-by 348-pixel color display (which costs \$2,400). Extra 256K-byte RAM cartridges cost \$865 each. Disk storage ranges from \$1,535 for a double-density floppy disk drive offering 630K bytes of storage to \$7,100 for a 40M-byte hard disk drive, the vendor said.

While noting Convergent Technologies' reputation for developing quality products, Dean L. Hiller, president of D.L. Hiller Associates in Sterling Heights, Mich., said that with more than 100 vendors in the microcomputer market, the Knowledge Worker system did not appear to offer any unique qualities. He added, however, that the availability of multiple operating systems appears

See **A.B. DICK** page 117



## MICROCOMPUTERS

# Teamwork seen easing micros into company structure

By Mike Dawson  
Special to CW†

If your company is like thousands of others, microcomputers are popping up like typewriters. And if you are like too many DP managers, that is almost all you know about where you are going with distributed micro-processing.

You may also be experiencing an avalanche of requests for micro-to-mainframe links for unknown, frivolous or semisecret reasons.

The availability of microcomputers and the fascination people have with them has turned engineers, department heads and other normally sane people into micro jocks, purchasing hardware and software at whim with little regard for corporate DP strategy.

A business is a network of interdependent entities — a system. Over the years, DP has organized its work into a system that usually mimics the system it serves. While the low cost of microcomputers encourages a more autonomous approach, a systematic approach will be more cost-effective.

If your company has no method of organizing and monitoring this growth, it may be losing dollars while it is saving cents.

## Assign team

One approach to the problem is to assign a team to become the in-house consultants. This three- to seven-member group establishes guidelines and monitors the purchase and use of microcomputers.

To be effective, the team needs ongoing support from top management, enough to be able to step on a few toes if necessary. To ensure fairness, the team needs people from different professions. If resources are available, an 'outsider with detailed knowledge of a range of micros and applications may be useful.

In exchange for enforcer status, the team members have an obligation to corporate users to be as technically up to date as possible. It is an unreasonable goal to ask them to be experts on every development going on in the micro world, but they can be savvy enough to cut through vendors' rhetoric and make sound decisions that will keep your company moving along a clearly defined path.

There are many ways to do this: holding membership in users groups and attending their meetings, using microcomputers themselves, attending seminars and subscribing to microcomputer publications.

The team should contact salesmen before your company is ready to purchase micros, because it can learn a lot from seeing demonstrations and learning about sales terms and conditions. From this exposure, the entire team should get a feeling for what is out there, which vendors your firm can work with and which are just pushing numbers.

Besides becoming very familiar with the field, the team should work with DP and management to draw up a broad long-term statement of objectives regarding micro policy. This

statement should be strong, yet flexible; its provisions can go so far as to recommend specific vendors or specific technical guidelines for vendors, yet the policy should be modifiable when the industry changes.

As requests are reviewed by the team, one philosophy that should be embraced is that when searching for a software solution to a problem, very often micros offer the potential for far more than a quantitative solution. Micros offer a new way of viewing how business is done.

The team needs to consider not only the problem, but also what caused the problem and what additional opportunities a particular so-

lution may offer. The task of replacing clerical duties with computers is being overshadowed by the tasks of using a company's own data to distill even more useful data.

But the team's recurrent short-term goal will be to meet the functional needs of departments. The team must take requests for software, investigate the market and select software that will answer those needs, then determine what hardware is best able to execute that software and address those needs. This process is a continuous one of asking, investigating and recommending. Therefore, a long-term policy is essential to ensure continued stability

in the group's decisions.

When dealing with vendors, the team should make it a standard selection policy to demand demonstrated proof of any claims made by vendors, at your convenience, on your turf.

If the salesman is claiming 100% compatibility with IBM, have him bring in a model of his micro for a day. Greet him with the following applications: a spreadsheet, word processing software, a compiled Basic application, an interpreted Basic application, a Cobol application and a home-grown assembler application.

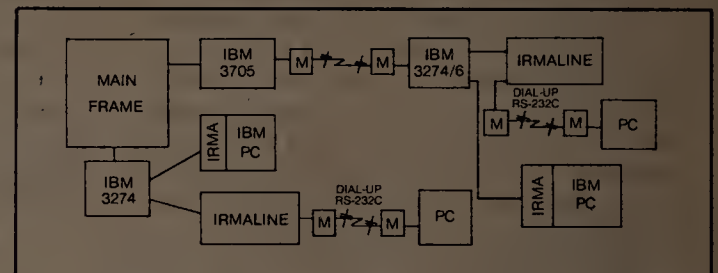
Many vendors claim to have developed one or two things that make

See **MICROS** page 117

Here are two beautiful ways to get small computers on line with the mainframe quickly, easily and economically—yours from DCA, home of the industry's first coaxial cable links between small computers and IBM 3270 networks.

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**IRMA and IRMALINE.**  
The DCA family connections that help small computers think big.



## MICROCOMPUTERS

**MICROS** from page 114

their products superior to all other vendors'.

Be particularly careful of this trap, because even if the claim is true, you do not always need the improvement.

The team needs the perspective to assess the true functional necessity of enhancements or improvements by asking, "Is this necessary to the successful operation of this application?"

Again, the team should insist on a hands-on demonstration; many enhancements are simply futures or word games, and some will actually make an application harder to use or slower to execute.

Whatever you do, do not buy futures. Every vendor in the world will

have anything you want next week if you sign today. It is better to wait until next week or go to someone who can deliver today.

**Team's decisions**

The team's decisions need to become almost law within your organization.

This requires continuing support from top management and, just as important, each team member must be cognizant of the responsibility that accompanies such power.

Team members must be highly motivated people who are anxious to stay on top of market development, are able to distinguish solid technological improvements from phantom improvements and, above all else, can keep an open mind through all evaluations.

**BOARD-LEVEL DEVICES****HERCULES COMPUTER TECHNOLOGY**  
**Color Card**

Hercules Computer Technology has introduced the Hercules Color Card, designed for the IBM Personal Computer and the Personal Computer XT.

Color Card features 16K bytes of random-access memory, 320- by 200-pixel resolution in four-color mode, 640- by 200-pixel resolution in monochrome mode and a parallel port.

The product is said to be compatible with graphics software such as Microsoft, Inc.'s Flight Simulator and Sorcim Corp.'s Supercalc III and to fit into one of the IBM Personal Comput-

er XT's short expansion slots.

The Color Card reportedly can be stored in the IBM Personal Computer with Hercules' Graphic Card and will automatically turn itself off when the Graphic Card is in use.

Color Card sells for \$245.

*Hercules Computer Technology, 2550 Ninth St., Berkeley, Calif. 94710.*

**AUXILIARY EQUIPMENT****P E SYSTEMS, INC.**  
**Ted 551**

P E Systems, Inc. has announced Ted 551, a hardware and software encryption module for the IBM Personal Computer.

Based on a Western Digital Corp. WD2001F DES microprocessor, Ted 551 features 8-bit cipher feedback, electronic codebook and cipher block chaining modes of encryption, according to P E Systems. The product reportedly supports user key entry, file creation and editing. Configuration set-up routines permit system tailoring and definition of default system selections. Ted 551 hardware fits into an expansion slot, and the software resides on a 5¼-in. disk.

The module costs \$499.

*P E Systems, 5520 Cherokee Ave., Alexandria, Va. 22312.*

**MICRO DISPLAY SYSTEMS, INC.**  
**Genius VHR version for IBM micro**

Micro Display Systems, Inc. has announced an IBM Personal Computer version of its Genius VHR full-page monitor.

The monitor permits the operator to use either a 66-line by 80-col. screen or a 25-line by 80-col. display, according to a Micro Display Systems spokesman.

The spokesman said the Genius VHR includes an interface card that supports the IBM 256-char. set and graphics.

The 15-in. monitor features 720- by 990-pixel resolution; a tilt screen; and amber, green or white characters, the vendor said.

The terminal also is said to have a bit-mapping option.

Genius VHR costs \$1,150.

*Micor Display Systems, P.O. Box 455, Hastings, Minn. 55033.*

**PRINTERS** from page 113

roughly 500 IBM Personal Computers, it purchased only 16 microcomputer letter-quality printers and 12 plotters. "The tendency at our company and at many other large companies is to buy larger systems for word processing," Goldfarb said. "Larger companies can afford word processors, and they did not think that microcomputers were powerful enough to use for word processing."

Goldfarb thinks this belief and corporate printer needs are changing. "Our 16 letter-quality printers and the (Multimate International, Inc.) Multimate word processing package are used by one department," Goldfarb said. "I think that package is convincing many large companies that microcomputers can be used for word processing."

"IBM's recent announcement of its microcomputer Displaywriter package will also spur corporate use of  
See **PRINTERS** page 117

IRMALINE™ does the same for remote IBM PCs, IBM PC XT's, Apple Lisas and DEC Rainbows, among others, with just a local phone call to a nearby 3270 controller.

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Digital Communications Associates, Inc.

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*InfoWorld*  
April 16, 1984

"For power and ease-of-use, 1-2-3's spreadsheet is hard to beat. Other programs do some things that 1-2-3 can't, but none seems to have been designed with comparable attention to detail and care for the user."

*PC Magazine*  
April 17, 1984

"Sit down behind 1-2-3 from Lotus Development and you'll never again ask why this \$495 business program tops the best seller list month after month: it's fast, efficient, easy-to-use, and sometimes, even fun."

*Computer Buyer's Guide and Handbook*  
May, 1984

"...two thirds of all United States companies buying business microcomputers last year chose 1-2-3 for making complex financial projections and displaying the results instantly in computer generated pie charts, bar charts and other graphic displays."

*New York Times*  
February 13, 1984

"1-2-3 is still in a class by itself."

*PC World*  
March, 1984

"Product of the Year 1983"

*Fortune*  
December 12, 1983

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MICROCOMPUTERS

PRINTERS from page 115

microcomputers for word processing," Goldfarb predicted. "Our next personal computer order will include a number of letter-quality printers."

As users move along the micro-computer learning curve, demand grows for letter-quality printers, other MIS managers said.

"Users buy a system without fully realizing what they can do with it," said Bob Young, senior vice-president at First Tennessee Bank in Memphis, Tenn.

"Later, as their knowledge increases, so do their requests for better tools," he said.

Not surprisingly, some vendors agree on a trend toward supplying letter-quality printers. "While electronic mail is useful, we still live in a

hard-copy world," said Craig Ringuette, merchandising manager at Okidata Corp. "Corporations are upgrading their printers and are looking for letter-quality output devices."

Networking microcomputers would supply many users with access to a few letter-quality and presentation-quality devices. However, large companies seem to be waiting for IBM to introduce a local-area network.

"We are a relatively large company, with 190,000 employees, yet we do not have one local-area network," Goldfarb said. "There has been a lot of talk about networking, but there are few microcomputer networks in place."

Another option is to work through a host computer, managers noted.

CRYSTAL from page 113

lived with single-tasking capability," he said.

Concurrent DOS, which features multitasking operation while running either Digital Research's CP/M or IBM PC-DOS applications, began shipment to hardware manufacturers this spring. A retail version of Concurrent DOS will be offered this summer, Langhorst said.

Also at the conference, Microsoft, Inc. President Jon Shirley forecast that his firm's new Windows software "will be on 80% of all MS-DOS computers by the end of this year," including existing micros.

Windows, an extension to the MS-DOS operating system, provides increased software portability, built-in graphics and window display facili-

ties, according to the Bellevue, Wash., firm.

System suppliers and independent software vendors are expected to receive development copies of the new software this month, with end-user products first appearing around September.

Shirley also discussed plans to migrate MS-DOS closer to Microsoft's Unix-based Xenix operating system, giving MS-DOS functionality to Xenix and vice versa. "We will have complete source code compatibility by the end of this year," he said.

Multitasking capabilities will be added to MS-DOS in a similar time frame, he said.

Further down the road, Microsoft is creating "softer software," which will draw on artificial intelligence techniques, Shirley said.

TALK from page 113

dor, Software Publishing Corp., says that the all-in-one package is only "a phase we're going through in the industry."

The key question in integration is simply whether the various functions can share data, he suggests, and he maintains that new application-managing software will simplify and speed this sharing.

Quarterdeck Office System's Desq, which began shipment two weeks ago, is the first commercial product able to integrate a host of third-party applications. Another example is Microsoft, Inc.'s Windows, which will provide users with "the single best functionality in any window vs. all functionality in one window," Gibbons adds.

Like many others, Gibbons compares all-in-one software with entertainment consoles holding radio, stereo and television sets. The advantage is that a complete package is offered. "The disadvantages are that it's bulky, none of the components are particularly good and if one goes out they all go out," he maintains.

Microsoft President Jon Shirley also notes that all-in-one packages must be compromises ("one package is not appropriate for all people").

Fred Langhorst, director of corporate planning and development at Digital Research, Inc. lists three reasons to avoid the multifunction approach. "No one company will produce excellent programs in each area; no one data structure will serve all applications effectively; and no single user interface will work adequately for a range of programs."

But a conflicting view comes from Brian Fischer, Context's senior vice-president for field operations, who claims to have invented the entertainment console analogy last year to show the benefits of all-in-one products.

A.B. DICK from page 113

to offer added flexibility to users.

"It sounds like it has something for everyone," noted David Cushing, a consultant with Omni Group, Ltd. in New York. He suggested that A.B. Dick may be trying to make a stronger name for itself by joining firms like Prime Computer, Inc. and Raytheon Data Systems Co. in using Convergent Technologies as a supplier.

The vendor is located at 5700 W. Touhy Ave., Chicago, Ill. 60648.



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## MICROCOMPUTERS

## SOFTWARE

**ANDERSON JACOBSON, INC.**  
**AJ Term Plus**

Anderson Jacobson, Inc. has announced a terminal emulation program reportedly designed to help users transport Ascii-compatible, time-sharing applications to a microcomputer.

The AJ Term Plus program runs on Anderson Jacobson's AJ Passport microcomputer and Bytec Management Corp.'s Hyperion micros. The package is said to allow time-sharing users to emulate Anderson Jacobson's AJ 510 Ascii-compatible terminal with its ability to transmit in character, line or block mode.

The AJ 510 terminal also allows formatted screens with protected and unprotected fields, and it offers display video enhancements such as blinking and inverse video and on-screen editing features. AJ Term Plus is said to provide setup menus for terminal and communications delimiters and the ability to store and retrieve formatted screens.

AJ Term Plus is priced at \$150.

Anderson Jacobson, 521 Charcot Ave., San Jose, Calif. 95131.

**INFOSYSTEMS TECHNOLOGY, INC.**  
**Rubix**

Infosystems Technology, Inc. has announced Rubix, a relational data base designed for an IBM Personal Computer using IBM's PC/IX, a Unix-

like operating system.

Rubix includes an English-like command language, a relational programming language, an interface to the C programming language and the capability to produce graphics output, according to Infosystems. The program reportedly features multiple perspectives of a data base for each user. Rubix is also said to allow the user to formulate queries and search multiple data bases without specifying where the data resides.

Rubix sells for \$795.

Infosystems Technology, 6301 Ivy Lane, Greenbelt, Md. 20770.

**RELATIONAL SOLUTIONS, INC.**  
**Survival Kit**

Relational Solutions, Inc. has introduced Survival Kit, an on-line reference guide for Microsoft, Inc.'s MS-DOS operating system.

Survival Kit is divided into three sections: PC/Help, PC/Messages and PC/Color.

PC/Help provides an explanation of each MS-DOS command, the correct format for the command and examples of how to use the command, according to Relational Solutions. PC/Messages reportedly displays error messages and lists the cause of the error message and the appropriate method of fixing the message. PC/Color allows the user to set blinking, underscore and boldness on a color monitor, a Relational Solutions spokesman said.

Survival Kit costs \$39.95.

Relational Solutions, 8723 Woodleigh Drive, Houston, Texas 77083.

**SOFTWARE CONNECTIONS**  
**LAN: Datastore enhancements**

Software Connections has enhanced LAN: Datastore, a relational data base for local-area networks.

The program allows users to merge information from 15 data bases; change record formats, fields and keys without reentering information; perform summary calculations; and store or read data in six types of Ascii formats, the vendor said. LAN: Datastore reportedly restricts user access at the field, file and record level and can limit user ability to read, update, delete and add records.

The data base works on a number of networks including Corvus Systems, Inc.'s Omninet and Orchid Technology, Inc.'s PC Net, according to Software Connections.

A single-user version of the program costs \$495; a five-user version sells for \$945; and a 16-user version is priced at \$1,945.

Software Connections, 2041 Mission College Blvd., Santa Clara, Calif. 95054.

**OMNITEXT II**  
**Conversion service**

Omnitext II has introduced a service that reportedly converts data from one microcomputer diskette to diskettes compatible with different equipment, without affecting format integrity.

The conversion service can copy diskettes from any word processing system, microcomputer or typesetter, according to the vendor. Additional-

ly, the service reportedly can convert data on paper or magnetic tape to other media. The service is said to offer 24-hour turnaround time.

Copies made from word processing diskettes are priced at \$45 each for two to 10 copies, \$40 each for 11 to 20 copies and \$35 each for larger volumes. Copies made from microcomputer diskettes are priced at \$25 each for two to 10 copies and \$15 each for 11 or more copies. Users must provide their own blank diskettes, the vendor said.

Omnitext II, 213 W. Institute Place, Chicago, Ill. 60610.

**EVERGREEN SOFTWARE PRODUCTS, INC.**  
**PC-Calculator**

Evergreen Software Products, Inc. has introduced a software package for the IBM Personal Computer and compatible microcomputers that reportedly provides all of the standard functions of a desktop calculator.

PC-Calculator is said to be able to solve complex mathematical, trigonometric, statistical and financial calculations. It prompts users for inputs and includes Help features.

The PC-Calculator is said to display numbers with up to 15 decimals. Additionally, the package can calculate the future and present values of annuities and store repeatedly used arithmetic operators and numbers for later recall, Evergreen said.

PC-Calculator is priced at \$39.95.

Evergreen Software Products, 11 Robinwood Court, Lancaster, N.Y. 14086.

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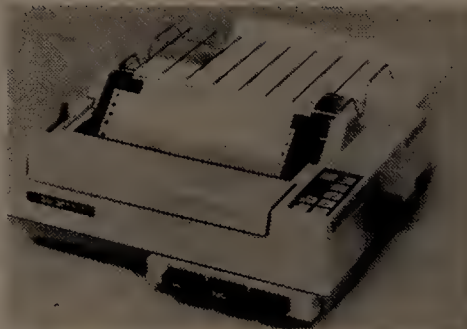
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**inc. service \***

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# COMPUTER INDUSTRY

## CDS 5000 debut sets Computervision apart First to meet MIS needs of manufacturing sector, analysts say

By John Gallant  
CW Staff

With the introduction of its high-end CDS 5000 system [CW, May 7], Computervision Corp. strategically positioned itself to meet the growing information management needs of the manufacturing sector, analysts told *Computerworld* recently.

"We were very impressed. Computervision's new strategy indicates the company understands that the key to factory automation is the management of information," said Peter Cohen, senior analyst with the Computer Integrated Manufacturing Service (Cims) of International Data Corp. (IDC) in Framingham, Mass.

Cohen said the announcement of the 32-

bit, IBM 4300-based CDS 5000 sets Computervision apart from its competitors in the computer-aided engineering, design and manufacturing (CAE/CAD/CAM) equipment industry. "No one else offers anything to approach the marketplace in the same way. The high-end system is designed to allow interaction between MIS and engineering. It allows for coordination between the two departments, and that will be a critical ingredient for the future."

Tony Friscia, Cims project manager at IDC, agreed. "The growth area — what the user really needs — is information management capabilities, data base management solutions and the ability to tie together information from different departments within a manufacturing orga-

nization. Computervision is answering that need."

Industry watchers also said that the alliance with IBM relieves Computervision of the need to focus on hardware development, at least at the high end, and that it strengthens Big Blue's hardware dominance in the CAE/CAD/CAM market.

"The battle between [Digital Equipment Corp.] and IBM for the high end has clearly swung in favor of IBM. IBM's backing will also let Computervision concentrate on applications software by relieving it of hardware development problems," said Dale Kutnick, executive director of the Yankee Group in Boston.

Grant Bushee, executive vice-president  
See **CDS** page 142



Storage Technology Corp. posted a \$16.7 million loss for the quarter and announced production delays for its new optical storage subsystem/**120**

### INSIDE

■ William Agee, a veteran of several boardrooms, delivered some organizational advice for AT&T while addressing the recent Unix Market Forum/**122**

■ An Illinois-based microcomputer vendor remains all in the family, but going public is seen as an "inevitable requirement" for remaining competitive/**123**

■ When a product achieved better name recognition than the company producing it, one company went with the flow and changed its company name/**135**

## U.S. vendors eyeing opportunities in overseas mart

By Robert Batt  
CW West Coast Bureau

With 78% of the gross worldwide product produced outside the U.S., American computer manufacturers are increasingly looking for opportunities to tap the international marketplace.

Paradoxically, the strength of the dollar in international money markets over the last two to three years has meant that for most of the major U.S. vendors, the pro-

portion of their revenues earned overseas has actually been falling.

"In dollar terms, [Sperry Corp.] has witnessed a decline in overseas revenues, as expressed as a percentage of its total business. However, if [Sperry] was able to translate its 1983 revenues into the currency of the respective countries, it would show a 50% increase in revenue growth," stressed Ted Springsted, vice-president of marketing for Sperry.

Most of the leading domestic computer companies have enjoyed a progressive increase in the dollar value of revenues earned outside the U.S. (see table on page 142).

As is to be expected, IBM dwarfs its competitors overseas and at home, with international earnings totaling \$17 billion in the last fiscal year, representing 42.4% of its total gross revenue. Hewlett-Packard

See **OVERSEAS** page 142

## Unix System V seen key player in AT&T computer line

By Robert Batt  
CW West Coast Bureau

SAN FRANCISCO — The Unix System V is the key product in AT&T's bid to become a major player in the computer industry, according to Thomas Crowley, software systems vice-president at AT&T Technologies.

Speaking at the first annual Unix Market Forum, sponsored here by Boscom, Crowley described Unix System V as "the key primary element of [AT&T's] total

computer product line."

Crowley said the extensive industry infrastructure that has been built around Unix severely prescribes the future direction of Unix developments.

"We have to live with this structure and make our decisions in the context of what is going to happen in that structure. We cannot afford to make any sudden deviations; otherwise, we may find ourselves all alone in left field, which will not do us much good," he said.

Crowley said AT&T is committed to an open architecture for Unix. At the same time, he admitted, the large number of versions of the Unix operating system is a problem because of the need to maintain an open source code.

"While we have reduced the number of versions, I don't think it will be possible to get it down to just one system. However, lots of customers are going to find it advantageous to stick to one system and de-

See **UNIX** page 135

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## COMPUTER INDUSTRY

# Republicans unveil prescription for industrial renewal

By Jake Kirchner  
CW Washington Bureau

WASHINGTON, D.C. — Congressional Republicans recently unveiled their prescription for industrial renewal and expansion, echoing their Democratic counterparts in calling for reliance on private sector initiatives and eschewing centralized government economic planning.

The House Republican Task Force on High-Technology Initiatives also followed the Democratic lead of a week earlier and avoided any mention of the term "industrial policy." The Republicans dubbed their renewal plan an "agenda for U.S. technological leadership and industrial

competitiveness."

Members of the Republican task force, chaired by Rep. Ed Zschau (R-Calif.), a former electronics industry executive, met with reporters May 1 to discuss the panel's report, which contained 14 recommendations for changes in antitrust, tax, patent and trade laws.

While the recommendations have been endorsed by several high-technology interest groups, including the American Electronics Association and the Computer and Business Equipment Manufacturers Association, Zschau and the task force's vice-chairman, Rep. Don Ritter (R-Pa.), argued that other industrial sectors

also will benefit.

"It's not just focused on high-technology industries or the 'sunrise' industries that some people think are the panacea to all our problems," Zschau said. "We have to rejuvenate the mature industries. . . . We think that can be done through the application of technology."

According to the task force report, "the proper role of government in promoting U.S. technological leadership and industrial competitiveness is to 'target' the process by which new ideas and products are developed — the process of innovation. That is, our government should focus on creating an environment in this

country in which innovation, new ideas and new companies are likely to flourish and in which firms in mature industries can modernize."

The panel cited four conditions for an innovation-promoting environment:

■ A strong commitment to basic research. This would include a 25% tax credit for corporate financing of university research and modified antitrust laws to promote joint research and development ventures.

■ Incentives for investors, entrepreneurs and innovators to provide capital and a risk-taking environment for innovative products and services. This would include a permanent R&D tax credit, intellectual property law protection for semiconductor designs and masks and better patent enforcement.

■ A strong educational capability. The task force recommended allowing foreign nationals with critical skills to remain and work in the U.S. and called for tax credits and enhanced deductions to firms contributing high-tech equipment and support to universities for educational purposes.

■ Expanding market opportunities, domestic and foreign. The Republicans called for replacing the Domestic International Sales Corp., for negotiating to reduce trade barriers and extend the General Agreement on Tariffs and Trade to cover investment and services and for streamlining export controls.

The task force said more than half of these proposals are incorporated in bills that have already received committee action in the House or Senate.

"I think the chances are quite good that a substantial percentage of these recommendations will be passed this year," Zschau said.

## STC reports loss of \$16.7 million for first quarter

LOUISVILLE, Colo. — Storage Technology Corp. recently reported a first-quarter net loss of \$16.7 million and announced it has reduced production estimates of its new optical storage subsystem.

The loss compares with a first-quarter 1983 profit of \$1.1 million, or 3 cents a share, for the computer peripheral maker.

First-quarter revenue for 1984 was \$179.5 million, a drop of 18% from \$219.9 million a year earlier.

Chairman Jesse I. Aweida attributed the loss to "reduced revenues on older products and low revenue contributions from several new products that are early in their production and marketing cycles."

The company said it lowered its production projections for its 7600 optical storage subsystem because development and testing are behind schedule. "Both customer orders and new applications for the optical disk continue to increase, and we are optimistic about the future of this product," Aweida said.

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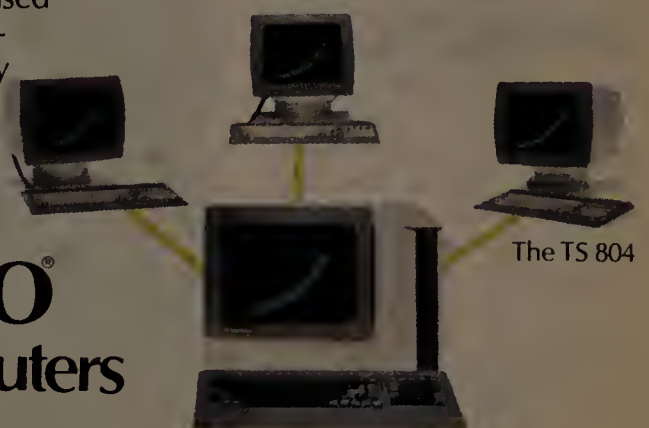
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## COMPUTER INDUSTRY

# Agee says AT&T needs internal, controlled revolution

## For successful development, marketing of Unix

By Robert Batt  
CW West Coast Bureau

SAN FRANCISCO — William Agee, the much-traveled corporate executive who recently entered the software field, believes AT&T needs a controlled revolution within its own organization to be successful in developing and marketing the Unix operating system.

Agee, chairman of the recently formed Uniform Software Systems, in a keynote address to the Unix Market Forum held here recently, examined AT&T's ability to compete in the computer industry.

Formerly the chief executive officer of Bendix Corp. and Allied Corp., Agee claimed AT&T will need to blend various factors, including acquisitions, divestitures and hiring the best people.

"AT&T will have to weigh various strategic questions, including buy vs. make vs. timing vs. competitive edge," he said.

### Fits and starts

Moving the organization ahead sooner rather than later should be the watchword for AT&T, according to Agee, even if this means preannouncing products. The company has a lot of inertia holding it back, he added, so industry watchers can expect fits and starts in its development.

"They will have to bring in people from the outside and blend them with people already in the organization. They need more professional management, particularly on the marketing and general management side. It is not an easy task, but I believe they will be successful," Agee stated.

Regarding Unix, Agee said the important question is not whether Unix will survive, but rather how big it will become. The key, he said, is marketing, and the manner in which AT&T takes its products to market will be crucial.

Unix software applications, Agee said, appear to have a market potential over the next few years of about \$2 billion.

Agee predicted that IBM will embrace more Unix-type applications in the not-too-distant future, and that Unix

will become a bigger part of the IBM world than it is today.

He also predicted almost all hardware manufacturers, including Apple Computer, Inc., will have Unix-compatible machines and that the trend of developing propri-

etary operating systems "is close to coming to a screeching halt."

One unanswered question, according to Agee, is whether the industry can develop the application software for Unix that will be easy to understand and can be supplied

inexpensively.

"Software that addresses business problems and that is understandable is essential. Developing software that enables managers to make quick and effective decisions should be the goal," Agee said.



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COMPUTER INDUSTRY

# Micro wholesale firm sees business as a family affair

## Future success of private firm rests with acquisitions, public offerings

By David Olmos  
CW Staff

ARLINGTON HEIGHTS, Ill. — In an area where private ownership seems increasingly rare, Tek-Aids Industries, Inc., a microcomputer wholesaler based here, has managed to keep things

all in the family.

But although Tek-Aid's owners, the Judson Beamsley family, know that a family-owned business has its advantages, they also realize that going public is the key to survival in their fast-growing as well as highly competi-

tive business.

A public stock offering "is an inevitable requirement to being successful in this business," according to Jeff Beamsley, Judson's 33-year-old son and the firm's vice-president of marketing and sales.

"The combination of expensive private money and the slim profit margins that distributors work on make it difficult to grow with strictly private sources of funds," Jeff Beamsley said in a recent interview.

Tek-Aids, which had reve-

nues of \$16 million for the fiscal year ended June 1983, had a modest beginning. In 1974, Judson began selling computer course materials from the basement of his son's apartment in Evanston, Ill., to schools and colleges. Later, when the micro market began to take off, the Beamsleys started buying computers from manufacturers and reselling them.

"We mainly started the business to have a nice thing to do on the side, during the weekends," Jeff Beamsley said. "We were fortunate to get involved in the business early enough that we grew in spite of ourselves."

According to *Inc.* magazine, Tek-Aids last year was Illinois' fastest growing company and the 35th fastest growing privately held company in the U.S.

With what Beamsley described as a "very aggressive growth plan," the company estimates revenues this year will reach \$40 million, or more than double last year's revenues. The firm employs 85 people and has offices in Chicago; Minneapolis; Philadelphia; St. Louis; Austin, Texas; and Pleasanton, Calif.

### Building market share

Like Arrow Electronics, Inc., a Greenwich, Conn., computer distributor, and other distributors that have swallowed smaller independents through mergers and acquisitions, Tek-Aids has sought to expand its holdings. The company's goal is to increase its market share by completing at least one minor acquisition each fiscal quarter, Jeff Beamsley said.

Last January, Tek-Aids bought out the computer systems division of Hollander and Co., Inc., a Hazelwood, Mo., distributor, and presently is negotiating another "major acquisition" of an undisclosed firm.

Tek-Aids hopes to remain successful by continuing its aggressive growth plan and by eventually going public. One challenge facing Tek-Aids may be whether it can maintain the family atmosphere that the Beamsleys believe have made the firm successful in the first place.

"Obviously that's one of the challenges we face," Jeff Beamsley conceded. "But it's certainly one we're willing to take on because we have successfully maintained that atmosphere through the past nine years of fairly explosive growth."

"Obviously a public company puts some additional restrictions on the way that you operate, so in some senses we'll have to change some of the ways we're used to operating," he added.

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## COMPUTER INDUSTRY

## Tandem reports profits down, revenue up for second quarter

CUPERTINO, Calif. — Tandem Computer, Inc. reported recently that fiscal second-quarter profits fell 69% to \$1.9 million, or 5 cents a share, compared with \$6.4 million, or 16 cents a share, for the comparable period last year.

Revenue rose 16% during the period ended March 31 to \$111 million from \$96 million a year ago. However, the company's second-quarter revenue was off 12% from the first quarter's \$126 million.

The company, a maker of mainframes for nonstop transaction processing, attributed the lower results

to seasonal factors, saying that the second fiscal quarter "historically has been weak for the company."

Tandem President James E. Treybig said, "The company's revenue growth did not meet our expectations, although our overall business remains strong."

He added that the company's Non-stop TXP system is being well received by customers.

Treybig said that despite the second-quarter results, "we feel positive about our basic business and the outlook for the remainder of fiscal 1984."

## CDC named AT&T supplier

MINNEAPOLIS — Control Data Corp. recently announced it has obtained a \$540 million multiyear contract as the principal supplier of memory devices for AT&T's new 3B series of desktop microcomputers and superminicomputers.

The contract covers 11 products, including 5.25-, 8- and 14-in. disk drives, tape drives and magnetic recording media, according to a spokesman for the vendor.

AT&T announced March 27 [CW, April 2] its plans to market a family of six computers in the 3B series. The systems range from the 3B2, a desktop microcomputer priced at \$9,950, to the 3B20 line of superminicom-

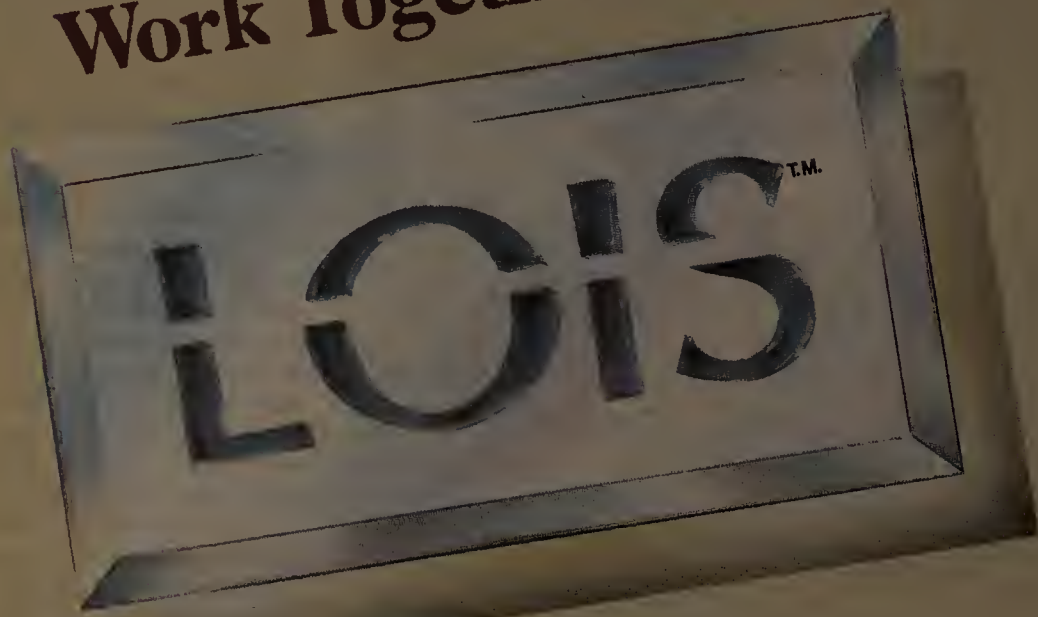
puters, priced between \$230,000 and \$340,000.

Gordon Brown, president of CDC's peripheral products unit, said the contract was one of the largest ever in his company's history.

CDC said it has begun shipping some of the disk drives, which are manufactured at its magnetic peripherals subsidiary in Oklahoma City and the Minneapolis-St. Paul, Minn. area.

Tape drives will be shipped from the Valley Forge, Pa., plant of the firm's computer peripherals division, and magnetic media will come from CDC's business products manufacturing plant in Omaha.

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## Paradyne sees drop in profits

LARGO, Fla. — Paradyne Corp. recently reported financial results for the first quarter ended March 31 that showed sharply lower profits of \$2.9 million, or 13 cents a share, compared with profits of \$5.5 million, or 25 cents a share, in the first quarter a year earlier.

The company reported revenues of \$60.6 million, compared with \$54.6 million a year ago.

Robert S. Wiggins, president and chief executive officer, said the first-quarter figures "showed an improvement, compared with the results reported for the immediately preceding three quarters."

Paradyne said first-quarter 1984 orders for its U.S. and international operations were approximately double their year-ago levels. The company attributed this growth to additional marketing resources and the improved world economy.

## DEC, Avnet alter marketing pact

MARLBORO, Mass. — Digital Equipment Corp. and Avnet Electronic Marketing Group recently announced changes to their existing marketing agreements.

The companies said that during the next three years Avnet will work with DEC to help it develop a direct sales marketing relationship with the retail dealers now handling DEC's microcomputer line. DEC said its focus on Avnet's microcomputer dealers is designed to strengthen and enhance DEC's personal computer marketing program.

Avnet's Hamilton Micro Systems Division has served as DEC's major wholesaler, with a network of some 300 retail outlets. DEC will now begin to market its microcomputers directly to many of these outlets, a DEC spokesman said.

Avnet will continue to carry and sell DEC micros to its customers who require distributor services and to serve as a backup source to any dealers who want to purchase directly from DEC, according to a spokesman for the vendor.

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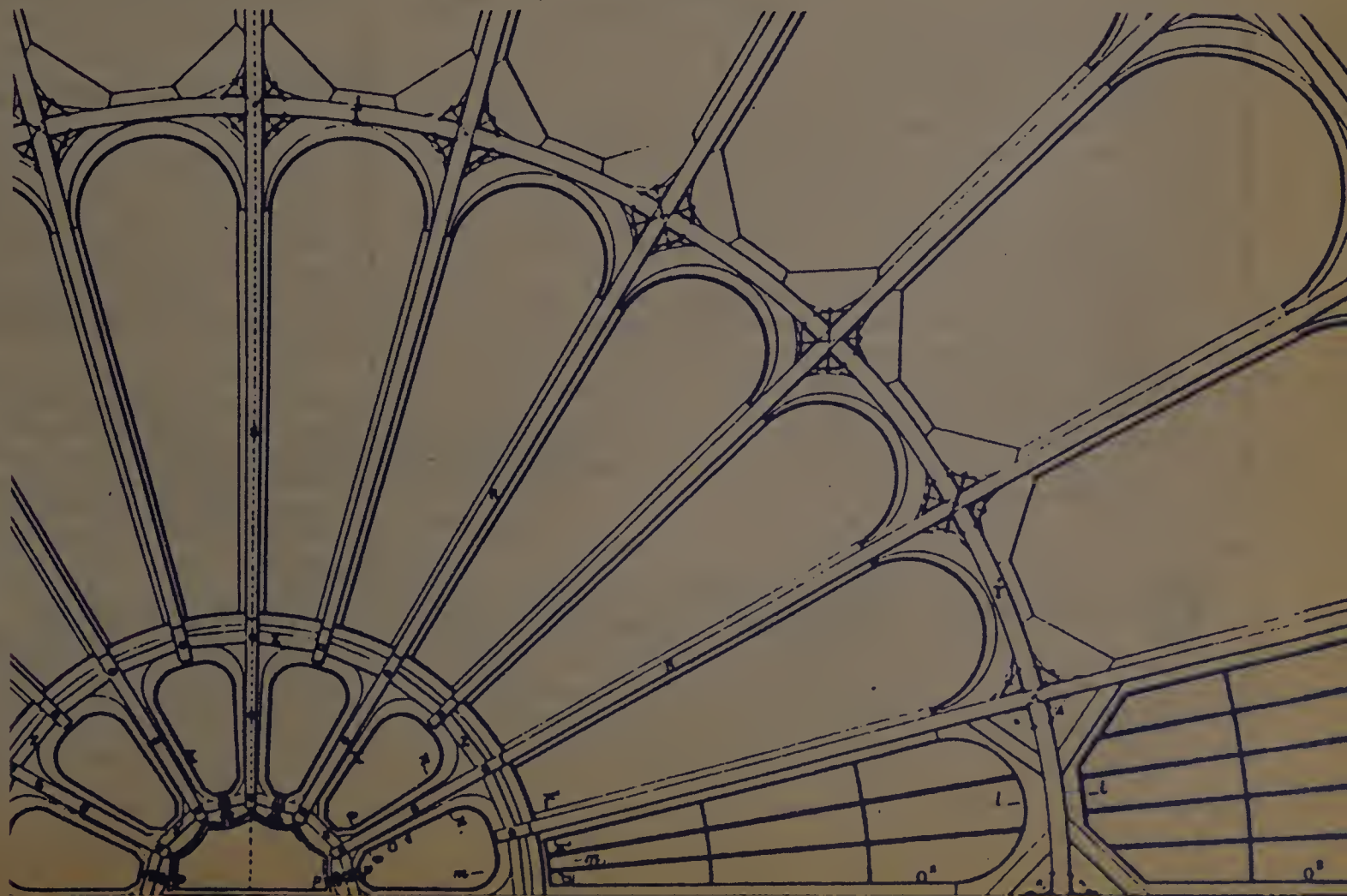
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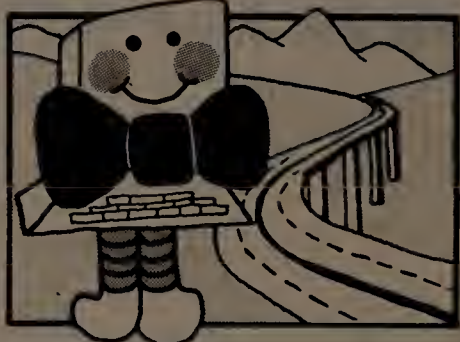
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## COMPUTER INDUSTRY



### FORECASTS AND FINDINGS

#### Japan ahead in key systems

NEW YORK — The Japanese are edging out U.S. suppliers such as AT&T, GTE Corp. and Comdial Corp. Business Communications Division in the fast-growing market for key telephone systems, according to a recently published report.

The 125-page report, "Key Telephone System Market 1984," published by market researcher Northern Business Information, Inc. here, found that, in 1983, Japanese shipments exceeded those of their U.S. counterparts for the first time. The Japanese now control almost 75% of the market for electronic key systems, the only segment of the market that is growing, according to the report.

The report predicts that U.S. suppliers of electromechanical key equipment, including AT&T, GTE, Comdial and ITT, will try to wage a comeback in the market with new products to be released soon. Copies are available for \$995 from Northern Business Information, 66 W. Broadway, New York, N.Y. 10007.

#### Micro support found lacking

MOUNTAIN VIEW, Calif. — Microcomputer users are more dissatisfied with the after-sales support they receive than any other category of office products users, according to a recently released report, "Analysis of User Requirements for Office Products."

The report from Input, a computer market researcher here, consists of surveys with 305 users in six office product categories: copiers, facsimile machines, private branch exchanges, microcomputers, word processors and workstations.

According to the survey, microcomputer users consistently rated the level of service they receive substantially lower than what they require. The report is available for \$950 from Input, 1943 Landings Drive, Mountain View, Calif. 94043.

#### Local-area nets growing

FRAMINGHAM, Mass. — The installed base of local-area networks will grow to more than 100,000 by 1988, up from nearly 16,000 at the end of 1982, according to a recently released report, "Communications Networks in the Office: Market and Trends."

The 81-page report from International Data Corp. here attributes the growth of the local-area network market to user need for more cost-effective and capable communications, newer technologies offering a variety of options, declining equipment costs and the proliferation of distributed systems.

The report focuses on the office communications environment, including user requirements for the development of communications networks, as well as current vendor networking solutions. It is available for \$1,950 from International Data, 5 Speen St., Framingham, Mass. 01701.

#### CAD/CAM use shifts focus

SANTA MONICA, Calif. — The computer-aided design and manufacturing (CAD/CAM) application for electrical and electronic design is undergoing a major shift from traditional turnkey systems to advanced computer-aided engineering (CAE) workstations, according to a study by International Data Corp. here.

The 66-page report, "Use of CAD/CAM/CAE in the Electrical/Electronic Design Market," projects that workstation shipments will account for more than \$1.1 billion of the total \$2.3 billion in CAD/CAM shipments for electrical and electronic design in 1987.

The report is available for \$1,000 from International Data's Pacific Technology Center, which is located at Suite 101, 1448 15th St., Santa Monica, Calif. 90404.

#### Micro software mart to boom

NEW YORK — The U.S. microcomputer software market is expected to grow from \$1.85 billion in 1983 to approximately \$12 billion (in constant 1983 dollars) by 1990, according to a recent study, "Microcomputer Software Distribution."

The 180-page report by Find/SVP, an information and research firm here, forecasts a shakeout in the general application business and home markets.

The report focuses specifically on evolving distribution patterns and strategies for microcomputer software. It is available for \$985 from Find/SVP, Information Products Division, 500 Fifth Ave., New York, N.Y. 10110.

#### Supermicros carving mart

SAN JOSE, Calif. — Supermicrocomputers will create an explosive new world market that could top \$123 billion by 1988, according to a report by Creative Strategies International, a market research and consulting firm here.

The report, "Supermicrocomputers: Market Positioning and Opportunities," predicts that a steadily growing number of users will start with or migrate to a supermicro.

The report is available for \$1,800 from Creative Strategies International, which is located at Suite 275, 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

#### IBM add-ons expanding

NORWALK, Conn. — The emerging dominance of IBM in the microcomputer industry has created a huge market for add-on equipment designed to improve the performance and expand the capabilities of originally configured IBM micros, according to a report by International Resource Development, Inc., a market research firm here.

According to the 241-page report titled "Market for Add-on Boards, Systems and Equipment for the IBM PC," the add-on market for IBM equipment suppliers was more than \$3 billion in 1984 and will climb to \$12 billion by 1994.

The report is available for \$1,850 from International Resource Development, 30 High St., Norwalk, Conn. 06851.



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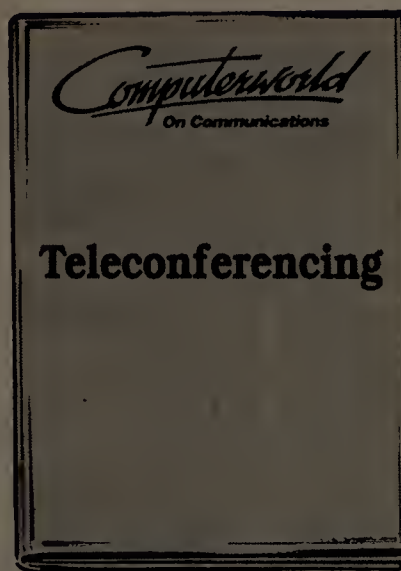
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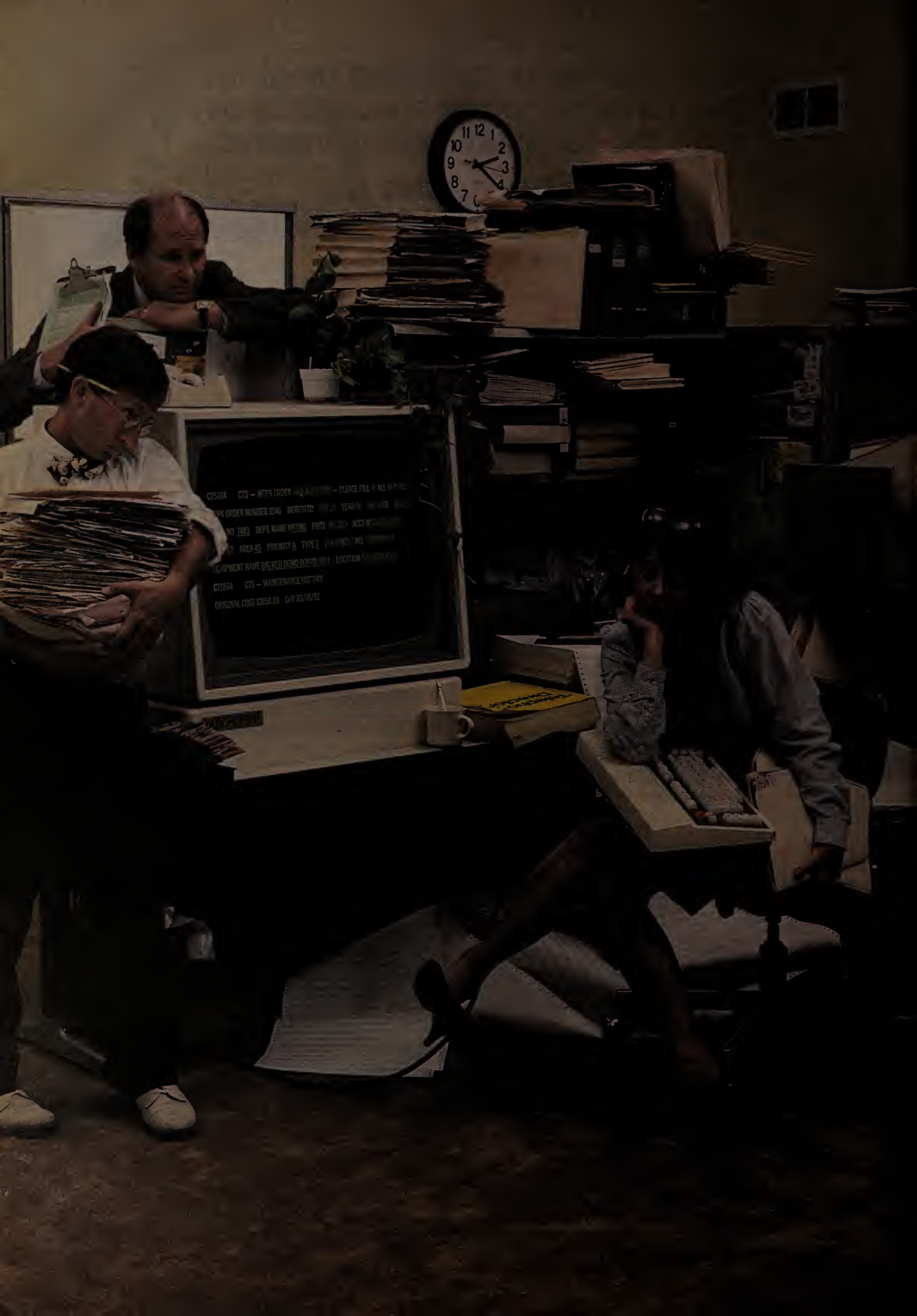
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## COMPUTER INDUSTRY

## Varian to begin five-year program to make gallium arsenide products

PALO ALTO, Calif. — Varian Associates recently said it will begin a five-year program to become a major producer of integrated circuits, solar cells and other solid-state devices made with the semiconductor compound gallium arsenide.

In announcing the plan, Thomas D. Sege, the company's chairman and chief executive officer, said the company will broaden and strengthen its existing line of gallium arsenide products as well as develop and produce new ones.

"We expect to be a major force in the gallium arsenide device and com-

ponents market by 1989," Sege added.

The initial step of the plan will involve a \$16 million expansion of the company's solid-state microwave division in Santa Clara, Calif.

The gallium arsenide products reportedly will be geared toward military and commercial applications for use in microwave components and subsystems produced by Varian and other suppliers. More specified markets would include military electronic countermeasures, satellite communications and high-speed processors, the company said.

## Proxy battle stings MAI

NEW YORK — Management Assistance, Inc. (MAI), despite growing sales of its Basic Four line of minicomputers, was stung by losses in its second quarter and first half because of the cost of fighting its losing proxy battle with dissident shareholder Asher B. Edelman [CW, April 9].

MAI lost \$3.8 million before taxes and \$1.7 million overall in the second quarter ended March 31, even though sales rose 21.7% to nearly \$109 million from \$89.5 million last year.

For the first six months of its fiscal year, MAI took a pretax loss of \$1.4 million and posted a net loss of \$647,000 on revenues of \$211.9 million, 18% above the \$179.6 million in

sales during the first half of 1983.

Raymond P. Kurshan, chairman and president of MAI, had warned that the cost of fighting the proxy battle would result in a second-quarter loss. The election cost the company \$6.2 million, he said.

Edelman denounced the election expense, saying companies ought not to "spend so much money on proxy fights."

Quarter-to-quarter sales of MAI's line of Basic Four minicomputer systems rose 6.5% to \$59.5 million from \$55.9 million in the first quarter of the year, but the increase was not enough to offset a quarter-to-quarter decline in revenues of 5.6%.

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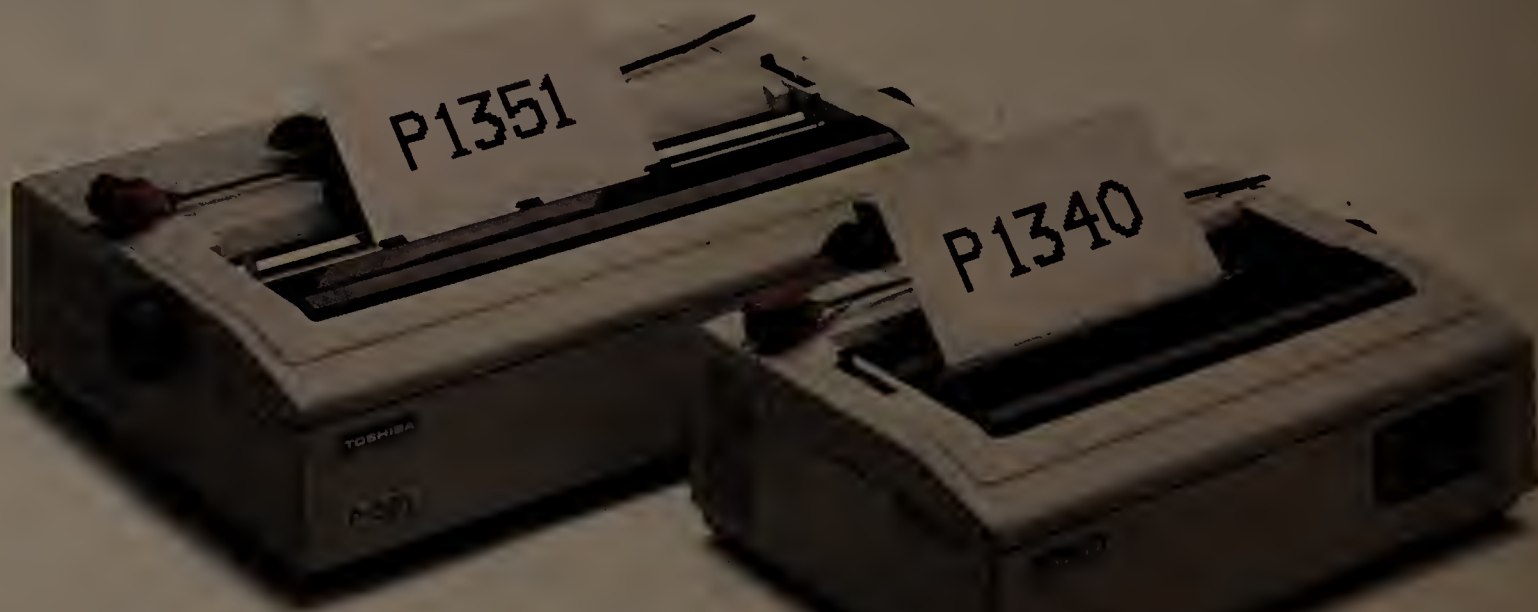
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Austin	May 10	Santa Clara	May 24	Oklahoma City	June 7
Baltimore	May 15	Toronto	May 10	Omaha	June 7
Charlotte, NC	May 8	<b>June</b>		Rochester	June 28
Cincinnati	May 2	Albuquerque	June 14	Syracuse	June 27
Ft. Worth	May 3	Boston	June 14	Washington, D.C.	June 12
Harrisburg	May 2	Buffalo	June 5	<b>July</b>	
Houston	May 24	Chicago	June 14	Dallas	July 10
Kansas City, MO	May 23	Denver	June 21	Oakland	July 12
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See **NICKEL** page 134

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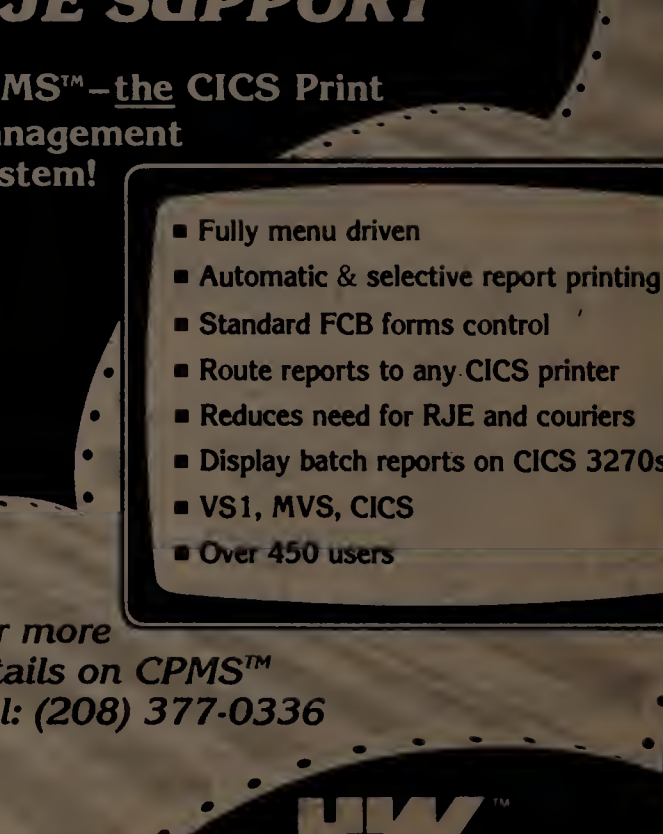
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## COMPUTER INDUSTRY

**NICKEL** from page 132

with \$448,000, or 15 cents per share, in 1983.

Lexidata Corp. announced revenues for the second quarter ended March 31 of \$9 million and profits of \$104,900, or 2 cents per share, compared with revenues of \$6.7 million and profits of \$149,900, or 3 cents per share, in 1983.

Xebec announced revenues for the second quarter ended March 31 were \$38 million, up from \$10.8 million in 1983. Profits were \$3.4 million, or 26 cents per share, compared with \$1 million, or 12 cents per share, in 1983.

Compaq Computer Corp. reported first-quarter profits of \$3.3 million, or 12 cents per share, compared with a loss of \$3.2 million in 1983. Revenues were \$62.9 million, compared with \$4.9 million in 1983.

Corvus Systems, Inc. reported that its net loss narrowed to \$207,000 in the third quarter ended Feb. 29. Revenues increased to \$12.6 million, compared with \$11.7 million in 1983.

Modular Computer Systems, Inc. announced profits of \$118,000 or 2 cents per share, for the first quarter 1984. This compares with a net loss of \$1.3 million, or 25 cents per share, in 1983.

Reynolds & Reynolds Co. announced second-quarter profits of \$4.2 million, or 88 cents per share, compared with earnings of \$2.5 million, or 54 cents per share, in 1983.

Tandon Corp. reported second-quarter revenues of \$105.6 million, up from \$70.6 million in 1983. Profits were \$10.4 million, or 21 cents per share, compared with \$7.7 million, or 15 cents per share, in 1983.

Fortune Systems Corp. reported first-quarter revenues of \$15.1 million, compared with \$20.8 million in 1983. Losses were reduced to \$3.4 million for the first quarter from a loss of \$6.6 million during the previous quarter.

The Standard Register Co. reported first-quarter revenues of \$101.3 million, compared with \$87.7 million in 1983. Profits were \$5.5 million, or 85 cents per share, compared with \$4.8 million, or 73 cents per share, in 1983.

Alpha Microsystems, Inc. announced profits for the fourth quarter ended Feb. 26 of \$1.6 million, or 50 cents per share, an increase of 144% over 1983 fourth-quarter figures of \$663,000, or 24 cents per share. Revenues were \$14.2 million, an increase of 62% over \$8.7 million in 1983.

Scan-Optics, Inc. reported first-quarter revenues of \$6 million, compared with \$5.5 million in 1983. Profits were \$963,000, or 16 cents per share, compared with \$873,000, or 15 cents per share, in 1983.

Varian Associates, Inc. announced second-quarter profits of \$14.2 million, or 65 cents per share, up from \$8.8 million, or 44 cents per share, in 1983.

Zenith Radio Corp. reported profits for the first quarter of \$14 million, or 64 cents per share, compared with \$8.3 million, or 41 cents per share, in 1983. Revenues were \$373 million, compared with \$333 million in 1983.

NBI, Inc. reported revenues for the third quarter of \$45.3 million compared with \$23 million in the comparable quarter of 1983. Profits were \$4 million compared with a loss of \$3.3 million a year earlier.

Syscon Corp. reported revenues of \$24 million for the three months ended Feb. 29 compared with \$18.8 million a year earlier. Profits were \$895,000, or 29 cents per share, compared with results of \$689,000, or 26 cents per share, a year earlier.

Protocol Computers, Inc. reported that revenues were \$4.5 million for the second quarter ended March 31, a 99% increase over the \$2.2 million reported in the second quarter of 1983. Profits were \$419,000, or 8 cents per share, compared with \$253,000, or 6 cents per share, in 1983.

NCA Corp. announced profits for the first quarter 1984 were \$307,000, or 12 cents per share, as compared with \$238,000, or 9 cents per share, a year earlier. Revenues were \$5.5 million compared with \$4 million in 1983.

Stratus Computer, Inc. reported that profits for the first quarter ended April 1 were \$1.1 million, or 6 cents per share, compared with

\$200,000, or 1 cent per share, a year earlier. Revenues were \$7.6 million, increased from \$3.3 million in 1983.

Cray Research, Inc. reported revenues of \$44.1 million for the first quarter ended in March, compared with \$27.5 million for the same period in 1983. Profits were \$5.7 million, or 39 cents per share, compared with \$2.1 million, or 15 cents per share, in 1983.

Altos Computer Systems reported profits for the third quarter ended March 31 were \$3 million, or 20 cents per share, as compared with \$2.3 million, or 16 cents per share, a year earlier. Revenues were \$28.8 million compared with \$20.4 million in 1983.

Emulex Corp. announced profits

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COMPUTER INDUSTRY

for the third quarter were \$3 million, or 23 cents per share, compared with \$1.8 million, or 14 cents per share, in the comparable period of 1983. Revenues were \$21.3 million compared with \$9.5 million one year ago.

**Scientific Computers, Inc.** reported profits for the third quarter ended March 31 were \$316,454, or 21 cents per share, compared with \$297,258, or 20 cents per share, in the third quarter of 1983. Revenues were \$3.8 million compared with \$3 million a year earlier.

**Ramtek Corp.** announced revenues for the third quarter ended March 31 were \$8.8 million compared with \$11.2 million in the third quarter of 1983. The company incurred a net loss of \$976,000, or 28 cents per

share, compared with a profit of \$600,000, or 20 cents per share, one year ago.

**Cermetek Microelectronics, Inc.** reported profits for the third quarter ended March 31 were \$456,000, or 13 cents per share, compared with \$111,000, or 4 cents per share, in the third quarter of 1983. Revenues were \$3.4 million compared with \$1.5 million in the same period of a year ago.

**ITT Corp.** announced profits for the first quarter were \$79 million, or 52 cents per share, compared with \$137 million, or 92 cents per share, in the comparable period of 1983. According to the company, foreign exchange effects reduced profits. Revenues were \$5 billion, or 5% higher than the \$4.8 billion a year ago.

## Vendor changes name to match its DBMS: Power-Base Systems

NEW YORK — Power-Base Systems is the new name of software developer GMS Systems, an 11-year-old maker of the relational data base manager bearing the same moniker.

Ralph Watson, founder and president of the New York-based firm, said the company had changed its name to make things easier on retailers of its four-month-old relational data base product, also called Power-Base. "It is such a sweet irony that our product became so much better known than our company that we elected to rename our company after our product," Watson said.

In the 10 years of its existence before releasing the data base manager, the former GMS Systems developed custom software products for financial institutions.

## UNIX from page 119

velop it as a standard, even though I cannot say what system that will be," he claimed.

Crowley said there is an urgent need for a standard operating system in the marketplace and that AT&T's objective is to cater to the maximum number of applications possible using Unix. Portability, he promised, will guide the future development of Unix.

"The use and widespread availability of Unix will benefit a lot of people. Therefore, if we can get a certain amount of cooperation among the major players, the industry will be the winner. It is not a zero-sum game," he stressed.

As part of AT&T's work on developing standards, Crowley added, the company is considering a variety of ways to ensure System V compatibility, including certification, cooperation with users groups in developing standards and licensing the trademark.

The company executive also noted the need for AT&T to develop a more effective distribution system; more regional sales centers both in the U.S. and overseas are being planned, he said.

There is also a need to expand AT&T's distribution channels, he added, although no firm plans for this have yet been developed.

Crowley also noted that AT&T has been getting requests from its customers to add real-time capability to Unix System V, and it has decided to do so, he said, although details were not released.

# when it could be flying?

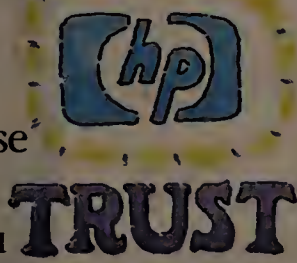


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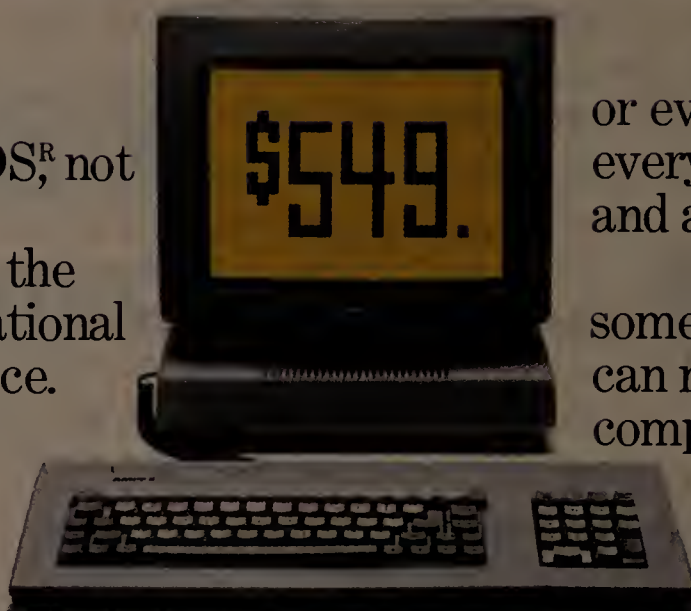
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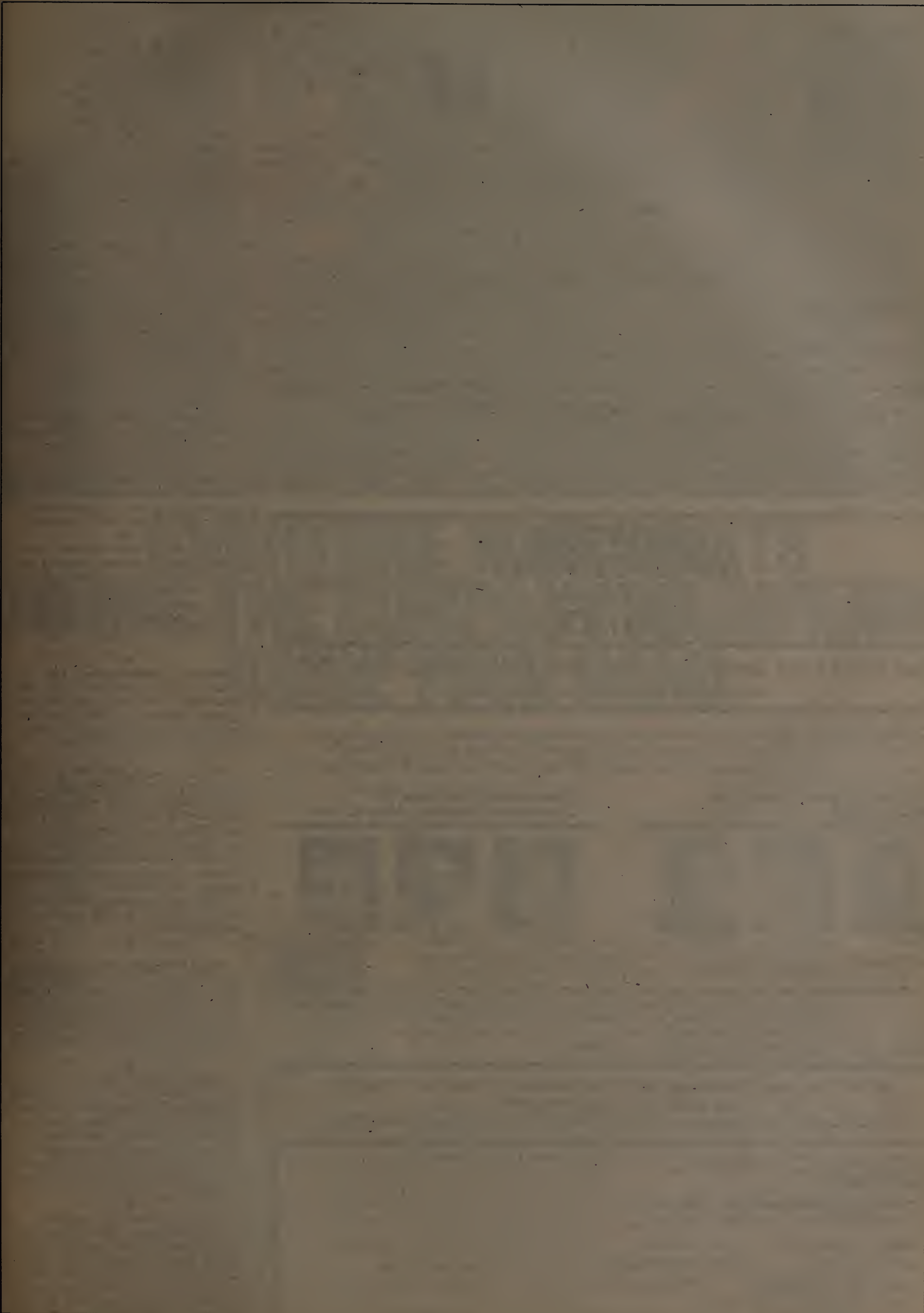
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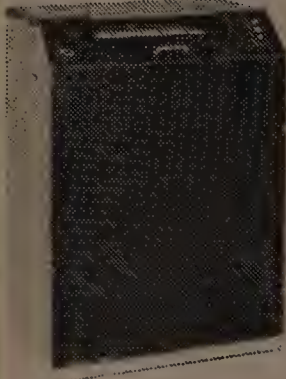
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## COMPUTER INDUSTRY



### SUPERSHORTS

**Burroughs Corp.** announced it has entered into a licensing agreement with **Superset, Inc.** Under the agreement, Burroughs will market and manufacture Superset products. Burroughs has also acquired a minority interest in Superset. No financial terms were available.

**Control Data Corp.** introduced a new maintenance service organization for users of IBM Personal Computers and Personal Computer XT's that is offering a broad range of contract and noncontract services with a flexible fee plan.

**Interactive Systems Corp.** announced an agreement with **Prime Computer, Inc.** to integrate its advanced user interface technology into Prime's line of 32-bit supermini-computers.

**Sperry Corp.** has opened a new production plant in Guadalajara, Mexico. The factory will produce terminal multiplexer devices for worldwide export and data entry systems for domestic sale.

**California Computer Products, Inc.** has opened a new 250,000 sq-ft facility in Hudson, N.H., to produce its line of graphics display products.

**Tandem Computer, Inc.** announced it has reached an agreement with **Cabledata** to settle litigation pertaining to use of Tandem trade secrets and confidential information relating to memory boards and other components of Tandem's Nonstop and Nonstop II systems. **Zitel Corp.**, also named in the action, remains a defendant in the lawsuit.

**Hewlett-Packard Co.** and **Protos Software Co.** announced an agreement granting HP a license to use the Protos fourth-generation language.

**National Semiconductor Corp.** announced the ground breaking for a state-of-the-art wafer fabrication facility in Migdal Haemek, Israel. A substantial portion of the investment will be financed by the government of Israel.

**Cygnit Technologies, Inc.** announced an agreement with **The Math Box** to distribute its Cosystem through Math Box's Office Technology Plus Computer Center, commonly called the GSA Computer Store.

**Corona Data Systems, Inc.** announced it has signed an agreement with **Daewoo Corp.** and **Daewoo Electronics Co., Ltd.**, whereby the latter has been licensed to manufacture partially configured systems for Corona's desktop and portable IBM Personal Computer-compatible computers. The companies believe that offshore manufacturing is a key factor for success in this competitive marketplace.

**Cray Research, Inc.** announced it has entered into a nonexclusive cross-licensing agreement with **IBM** covering patents on information handling systems, including existing patents and those granted or applied for until Jan. 1, 1989.

**Control Data Corp.** announced it has acquired a 25% equity in **SMR Computer Services, Inc.** The agreement provides for SMR to become a medical information processing center and an approved distributor of CDC's Medtec medical information system. Terms of the sale were not available.

**ITT** announced the formation of the ITT Business Information Systems Group and the appointment of **David Sen-Lin Lee** as group executive. One of the purposes of the group is to develop a larger ITT presence in the business information and communications areas, both in the U.S. and abroad.

See **SHORTS** page 140

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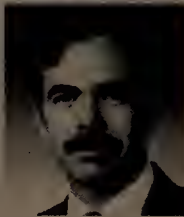
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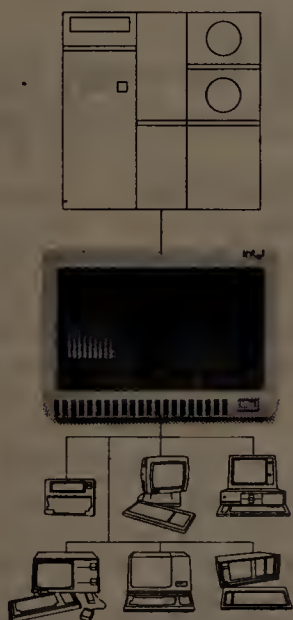
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COMPUTER INDUSTRY

CDS from page 119

ident of Cupertino, Calif.-based Infocorp, said IBM's hardware support has relieved Computervision of the need to reinvent the wheel. "Computervision has been somewhat behind technologically. But by joining IBM, it picks up the technology, and it gets the room to further develop its software offerings."

But more importantly, according to Neil Kleinman, general manager of IDC's Pacific Technology Center, Computervision can now take advantage of IBM's customer base. "This is a symbiotic relationship. It opens the door for IBM users to utilize Computervision's technology, and it will add to Computervision's market share. The CAD and MIS functions are finally compatible."

OVERSEAS from page 119

Co., which includes instruments as well as computers in its sales figures, is a distant second with \$2 billion; 42.5% of its revenues are generated internationally.

Richard Alberding, HP's senior vice-president of international operations, sees two trends happening simultaneously in the overseas arena:

■ The international marketplace itself is becoming increasingly attractive as countries awaken to the role that information management plays in increasing productivity.

■ As economic nationalism becomes more prevalent, the developing world in particular wants to have its information needs based locally. "These countries look upon the computer business as a way of moving

U.S. and International Revenues of Leading Computer Vendors — 1979-1983 (measured in \$ billions)										
Company	U.S. 1983	Int'l 1983	U.S. 1982	Int'l 1982	U.S. 1981	Int'l 1981	U.S. 1980	Int'l 1980	U.S. 1979	Int'l 1979
Hewlett-Packard Co.	2.7	2.0	2.3	1.9	1.9	1.7	1.5	1.6	1.28	1.25
NCR Corp.	2.0	1.7	1.8	1.7	1.6	1.8	1.5	1.8	1.4	1.8
IBM	23.12	17.05	19.03	15.33	15.08	13.98	12.4	13.78	10.8	12.2
Burroughs Corp.	2.48	1.84	2.42	1.76	2.04	1.36	1.63	1.27	1.61	1.21
Wang Laboratories, Inc.	1.10	0.53	0.80	0.35	0.57	0.28	0.35	0.19	0.20	0.11
Data General Corp.	0.54	0.28	0.53	0.26	0.47	0.25	0.40	0.24	0.34	0.16
Digital Equipment Corp.	2.7	1.49	2.49	1.38	1.94	1.25	1.47	0.89	1.14	0.65
Sperry Corp.	1.7	1.1	1.58	1.25	1.5	1.2	1.27	1.05	1.15	0.9
Control Data Corp.	2.9	1.51	2.71	1.45	2.58	1.65	2.23	0.95	1.57	0.87

into high technology, addressing their balance of payment problems and attracting new jobs," he explained.

With countries such as Brazil and Mexico insisting on a strong domestic

content in computer products manufactured by overseas firms, the message for vendors, Alberding said, is, "don't be locked in to any one strategy."

"We are going to have extremes in different countries. The need is to be adaptive on a country-by-country basis, and the challenge is going to be to maintain an acceptable level of profitability in the different circumstances of each nation," he added.

In a series of telephone interviews with senior executives from the leading data processing vendors, the consensus was that the Pacific basin, particularly countries such as Singapore and Taiwan, offer the best opportunities for growth in the next few years.

On the other hand, Latin America, with its economic and political instability, is seen as a continuing area of uncertainty for computer manufacturers over the remainder of this decade. NCR Corp., for example, said it has experienced losses in Mexico, Brazil, Venezuela and Argentina in recent years.

"One of the basic criteria [Data General Corp.] is looking for in a long-term investment is a stable political and economic environment in which to operate, and conditions in Latin America are not conducive to this at the moment," commented George McClelland, vice-president and treasurer at DG.

Nevertheless, the outlook for U.S. manufacturers overseas is bright, particularly those able to take advantage of the worldwide proliferation of microcomputers. Indeed, for some companies, the personal computer revolution is turning back the clock in the way business is conducted overseas.

Springsted explained, "[Sperry] has come full circle. Twenty-five years ago, it began setting up a chain of distributors overseas; then as [Sperry] grew, it bought them out and turned them into full-fledged Sperry operations. Now, as [Sperry] develops a serious commitment to micros, it finds itself back again looking for distributors to handle its new personal computers, often to people with whom it had business relationships over 10 years ago."

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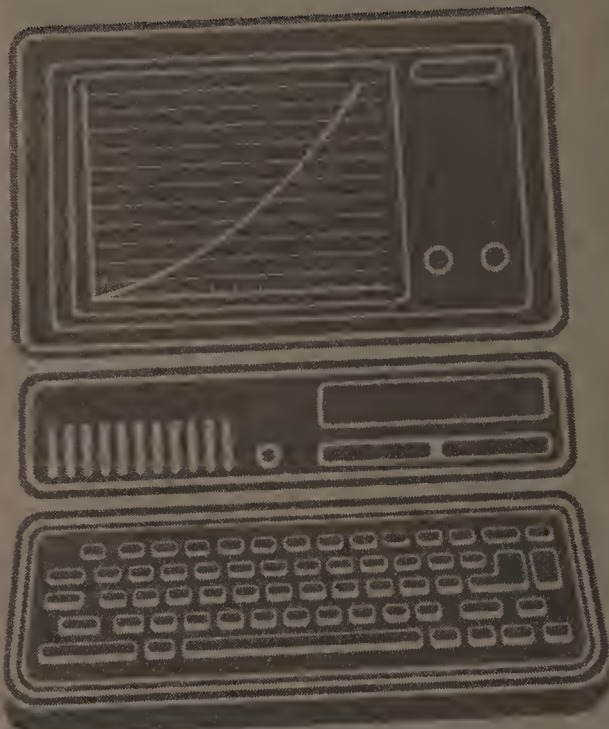
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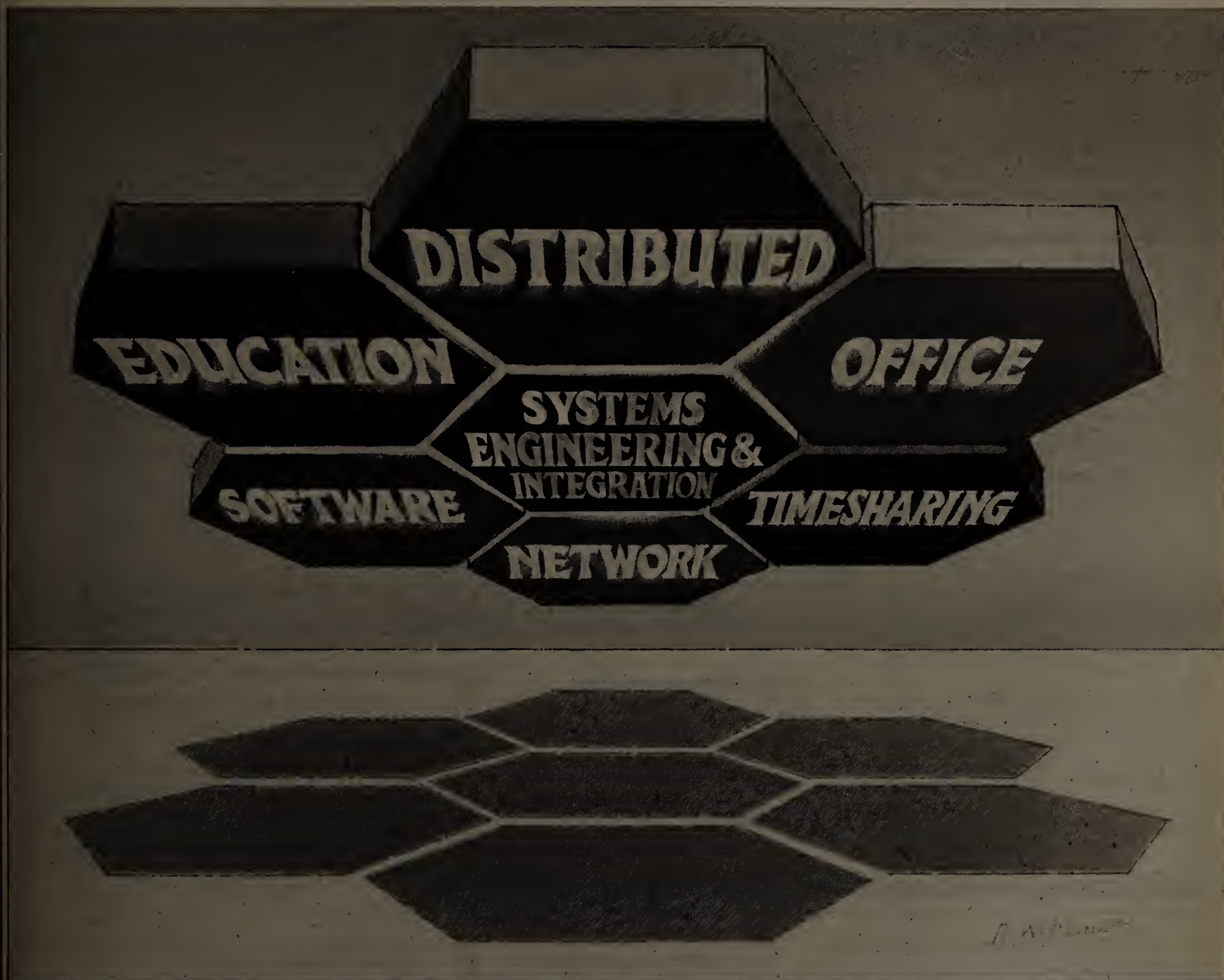
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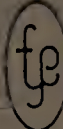
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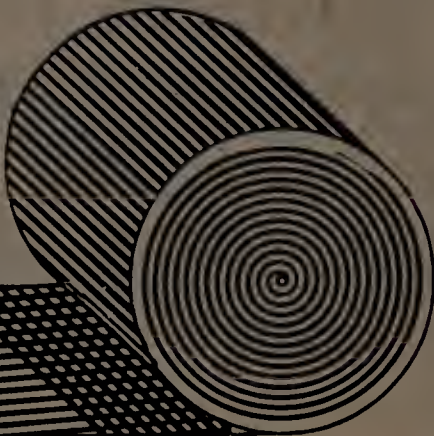
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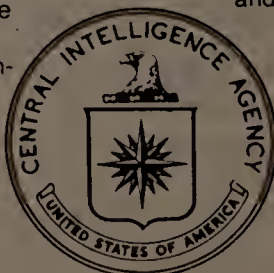
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Dept. 90-31-432  
Marietta, Georgia 30063

An Equal Opportunity/Affirmative Action Employer.

**Lockheed**  
-Georgia Company  
LEADERSHIP IN TECHNOLOGY

## VM/CMS Professionals

We need help in a few statewide positions. Requires 2-5 years' experience in VM/CMS with strong emphasis placed on proficiency in EXEC, COBOL, and FORTRAN languages. Demonstrated experience in interactions with technical and non-technical work groups is also required. If you have this experience plus, send your resume to:

Management Personnel, PACIFIC BELL,  
One Montgomery Street, Crocker  
Center, West Tower, Room 970, Dept.  
KK-72, San Francisco, CA 94104.  
Citizenship/Permanent Residency required.  
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Our Computer Aided Engineering (CAE) area in Mission Viejo, CA has an excellent opportunity for a Section Manager. The selected individual will have knowledge in computer system logic design and data capture, netlist generation, test generation, design control and database. Requires simulation and factory interface experience with at least 10 years experience in Computer Aided Design, as well as a BSEE, BSCS or Math degree and some prior management experience. Background in computer graphics, electrical rules, checks and Apollo (Mentor) workstations is also desirable.

For consideration on the above position, please call COLLECT (714) 768-2016, or send resume, with salary history, in confidence to: **Burroughs Corporation, Professional Personnel, Dept. CW-0514AS, 25725 Jeronimo Road, Mission Viejo, CA 92691.**

### Technical Writers

We're rapidly accelerating our documentation activities to keep pace with exciting new environmental and systems software products. Growing so fast, we're opening a new facility in Lake Forest, CA to complement our Santa Ana and Mission Viejo, CA software development centers.

Our opportunities are exceptional for individuals who will be responsible for researching and writing new user manuals. Selected individuals will be skilled in technical writing and well-grounded in both computer science and formal communications techniques. Should also possess a degree in Computer Science, Technical Writing or Journalism.

For consideration on the above positions, please send your resume to: **Burroughs Corporation, Human Resources, Dept. CW-0514, 3519 W. Warner Ave., Santa Ana, CA 92704.**

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**Burroughs**

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Cedars-Sinai Medical Center  
8700 Beverly Blvd.  
Los Angeles, CA 90048

### TEACH AND TRAVEL

The University of Maryland University College seeks faculty to teach undergraduate computer science and information systems management courses on U.S. military bases in Europe or Asia. Ten-month renewable appointments are available beginning August 1984. Candidates should have at least a master's degree in computer science or a related field and recent college teaching experience. U.S. citizenship is required. Benefits include transportation, a currency adjustment allowance and military base privileges (PX, commissary, etc.). Frequent travel and the cost of schooling make these positions difficult for those with children. Send your resume to Dr. Lois A. Mohr, Overseas Programs, The University of Maryland University College, College Park, MD 20742. AA/EEO.

### MICRO R & D Software Consulting San Francisco, CA

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To design graphics system for enhancement of products and services including designing systems, programs, record layout, and operational specifications, flow chart preparation, and system development, test and implementation; recommends equipment configuration changes/enhancements; trains staff in use of equipment. Proficiency in Basic and Fortran required. Experience with Tektronix Graphic System and/or SAS Graphics desirable. Minimum two years experience plus BS/Computer Science or one year plus MS/Computer Science. Salary DOQ. Send resume and salary requirements in confidence to Frank Russell Company, PO Box 1616, Tacoma, WA 98401. EOE, Principals only.

### LONG TERM HIGH RATES CONSULTANTS

System Programmers (4),  
MVS (1), VM (1), IMS (1),  
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Send resume to:

Computer Software  
Consultants  
250 S. Van Dam Street  
Alexandria, VA 22304  
(703) 751-6136

### COMPUTER/BUSINESS

Assistant/Associate Professor. Master's degree is required in one of the following areas: Computer Science, Data Processing, or Computer Programming. This is a full-time, nine-month teaching position in Computer Information Science courses, BASIC, FORTRAN, COBOL, PL/1, Assembler, and some basic business courses. Rank and salary commensurate with training and experience. Date of appointment: Summer 1984. Send resume, transcripts, and three letters of recommendation to: Roy Graham, Personnel Officer, Morris College, North Main Street, Sumter, South Carolina 29150. Morris College is an Equal Opportunity Affirmative Action Employer. Women and minorities are encouraged to apply.

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Willard Payne  
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It was obvious, when we first met him, that Willard was an intelligent, and energetic achiever. He was, at that time, a young Programmer with limited experience. Nevertheless, being an ambitious person, he had set high goals for himself and a rigid schedule for their achievement. His problem was that he didn't know specifically which companies offered the strongest potentialities for the promotions that would meet his needs.

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Professional computer career planning is only one of the many excellent services offered by National Computer Associates... and no one does it better!

We can do the same thing for you as we have done for Willard Payne and many thousands of others. Come in. Call. Or mail your resume to the NCA firm nearest to you. Confidentiality is assured. Company clients assume our fees.

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**DALLAS:** DataPro Personnel Consultants  
12720 Hillcrest, Suite 520  
Dallas, Texas 75230 (214) 661-8600

**DETROIT:** Electronic Systems Personnel, Inc.  
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2000 South Post Oak  
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107 N. Pennsylvania, Suite 404  
Indianapolis, Indiana 46204 (317) 639-5601

**KANSAS CITY:** O. P. Career Associates  
6405 Metcalf, Suite 502  
Shawnee Mission, Kansas 66202 (913) 236-8288

**LOS ANGELES:** Superior Resources, Inc.  
Personnel Service  
17141 Ventura Boulevard, Suite 200  
Encino, California 91316 (213) 986-4400

**MILWAUKEE:** EDP Consultants, Inc.  
7332 West State Street, Suite 3  
Milwaukee, Wisconsin 53213 (414) 475-0077

**MINNEAPOLIS:** Electronic Systems Personnel  
858 Twin City Federal Tower, 121 S. 8th St.  
Minneapolis, Minnesota 55402 (612) 338-6714

**NEW JERSEY:** Systems Search  
90 Millburn Avenue  
Millburn, New Jersey 07041 (201) 761-4400

**NEW YORK:** Botal Associates, Inc.  
7 Oey Street, Suite 410  
New York, New York 10007 (212) 227-7370

**NEW YORK UPSTATE:**  
CFA Associates Personnel, Inc.  
2530 James Street  
Syracuse, New York 13206 (315) 463-5225

**NORTH CAROLINA:** OataMasters,  
Div. of TaskForce, Inc., P.O. Box 6888  
Greensboro, North Carolina 27405  
(919) 373-1461

**PHILADELPHIA:** Systems Personnel, Inc.  
115 West State Street  
Media, Pennsylvania 19063 (215) 565-8880

**PHOENIX:** Professional Career Consultants  
4628 North 17th Street, Suite H101  
Phoenix, Arizona 85016 (602) 274-6666

**SAN FRANCISCO:** The Computer Resources Group,  
Inc. Agency, 303 Sacramento Street  
San Francisco, California 94111 (415) 398-3535

**SEATTLE:** Houser, Martin, Morris & Associates  
1940 116th Avenue N.E.  
Bellevue, Washington 98004 (206) 453-2700

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## SYSTEMS PROGRAMMER

Kawneer, the world's leading producer of architectural aluminum products is building a new Corporate headquarters in beautiful Technology Park, Norcross, Georgia, a suburb of Atlanta. This move, company growth and expanding State-of-the-Art data processing department have created opportunities for Systems Programmers with one of the following experience profiles.

**1. Required:** VM/SP, VM related software (IFS, CMS, IPCS, etc.) VSE interface, Assembler, COBOL

**Also Desired:** VM networking (PVM, RSCS), and SNA networking, VSE or MVS systems experience, CADAM (IBM/Lockheed graphics) maintenance experience, PL/1, RPG-II

**2. Required:** MVS or MVS/XA (and products) configuration and maintenance, VSE (and products) configurations and maintenance, VSE to MVS migration experience (under VM) Assembler

**Also Desired:** SNA and BSC network experience, COBOL, PL/1, RPG-II

**3. Required:** Installation, maintenance, tuning, consultation on CADAM systems (IBM/Lockheed graphics software) running under VM/CMS

**Also Desired:** Ability to maintain VSE or MVS and typical related software in a manufacturing environment, PL/1

Temporary training out of state required. If you have the above qualifications, excellent long-term career advancement potential, and will contribute to our team success, please submit a resume, including salary requirements in confidence to:

**Kawneer**

KAWNEER COMPANY, INC.

270 Technology Park

Suite 14

Norcross, GA 30092

Attention: Len Rehm

Or Call: (404) 449-5555

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SABCO needs hard working professionals capable of producing quality results with high productivity.

Positions require 2 - 5 years experience with banking packages or applications software such as: Kranzley's IL, UCC's FCS system, CPCS, DDA, SDA, or CDA.

Good working knowledge of OS/MVS COBOL and debugging skills required. College degree and CICS experience desirable.

#### SYSTEMS PROGRAMMER

We need result orientated persons interested in expanding his/her career within a dynamic organization.

Position requires 2 - 5 years experience from large IBM installation.

System generation experience required for MVS, CICS and NCP. Knowledge of Performance Tuning and MVS Internals desirable.



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Data Processing

## SYSTEMS ANALYST PROGRAMMER ANALYST

Gesco, a major computer service and software development company for the financial industry, supports a telecommunication network of over 7,000 on-line terminals run in a large scale multiple CPU environment utilizing MVS/SP, JES 2, CICS, ACF/VTAM, ACF/NCP, TSO and INTERACT. As a result of our steady growth, we are seeking the following individuals to join us at our Fresno, California Headquarters.

### SYSTEMS ANALYST

You must have a solid background in the Savings and Loan and/or Banking industry with a minimum of 3 years **Information Systems** experience using structured analysis techniques. Having implemented large projects, you must possess excellent organizational, communications and analytical skills.

### PROGRAMMER ANALYST (ASSEMBLER/COBOL/CICS)

You must have a minimum of 3 years programming experience in a large IBM mainframe environment within the Savings and Loan and/or Banking industry. Additionally, a solid background in structured programming techniques is highly desired.

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We're looking for talented software and computer engineers with a BS or MS and technical experience in minicomputer and microprocessor systems used in the development of software for real-time equipment control. Assignments may involve design of software systems for products or manufacturing control; programming mini- and/or microcomputers; integrating computer software and hardware into complex electromechanical systems; and quality assurance of computer programs.

Kodak also has opportunities for electrical engineers in the areas of design and development, video, test, systems and optical engineering.

We offer competitive salaries, liberal benefits, and opportunities for individual contribution and growth. Positions are available now. If you have the necessary skills and drive to meet the challenge of working for a corporation in the forefront of technology, send your resume today.

Personnel Resources  
Dept. DCPW  
Eastman Kodak Company  
Rochester, NY 14650

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Comshare, Inc., is an international computer software and services corporation. Our decision support systems (including Comshare's revolutionary System "W") are used worldwide by professionals in the fields of finance, marketing, data processing and manufacturing. A strong reference base exists for this proven product.

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For immediate consideration, send resume with earning history to John Kiley, New England District Manager, Comshare, Inc., 60 William Street, Wellesley, MA 02181.

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### SYSTEMS ANALYST

We are seeking a bright and responsible person with 4-7 years FORTRAN, PASCAL and/or COBOL experience to be part of our exciting and dynamic organization. Individuals with experience in database management systems and VAX VMS or RSX 11M a plus.

Consolidated Group, Inc. is a nationally known and respected administrator of group insurance programs for small employers.

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Please send your resume to Joan Goldfracht, Personnel Administrator.

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### DATA PROCESSING MANAGER

Snyder's of Hanover, Inc., a major snack food company based in Hanover, PA, seeks an accomplished data processing professional to manage, develop and maintain business applications on its state of the art System 38. The DP Manager is responsible for coordinating systems design and analysis with users and staff as well as consultants. The successful candidate will have a minimum 5 years experience in the data processing field with at least 2 years as Data Processing Manager or Project Leader and will be familiar with RPG and COBOL languages. Communications experience a plus! Bachelor's degree in Computer Science or Accounting/Business Management preferred.

We offer a competitive salary and fringe benefits package including dental. If you are qualified and looking for a progressive professional environment where you can apply your management and technical skills, please send your resume with salary requirements to:

**Industrial Relations Manager**  
Snyder's of Hanover, Inc.  
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Hanover, PA 17331  
Equal Opportunity Employer



## DATA PROCESSING CAREERS

IBP, inc. is a pioneer in the development of boxed beef and beef products as well as a growing factor in the fresh pork industry. Our domestic and international sales in 1983 generated from 14 plants in 11 states were in excess of \$6 billion. Since our founding in 1961, we have averaged an annual growth rate of 25% which has made us the 5th largest food processor in the United States and the world's largest beef processor.

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- Work in a large shop with a flexible structure
- Have excellent career advancement opportunities for those who earn them

#### WE NEED:

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Tenure track teaching position in Computer Science/Data Processing, starting with the Fall 1984 semester. Masters degree in Computer Science and/or teaching experience in the field is desired. Salary and rank dependent on experience. A high level of communication and teaching experience is desired. Teaching assignment in programming languages, systems and procedures, etc., dependent on candidate's knowledge and experience. Apply in writing to Mr. Fredric N. Misner, Search Chairperson, Ulster County Community College, Stone Ridge, N.Y. 12484 or call for an application (914) 887-7621, ext. 264. Deadline for receipt of application is May 31. Ulster reserves the right to extend this deadline. Ulster County Community College is an Equal Opportunity/Affirmative Action Employer.

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Assist sales: 10% programming, 90% analysis. Solve customer problems. New Columbia, Maryland branch office. Possible growth to branch manager. Very good benefits. Need FORTRAN. DEC desired. Send resume to:  
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Small independent suburban college seeks Information Systems Management Professor for Graduate program serving mature students with business backgrounds. Ideal candidate should have both PhD and some information systems experience. Send vitae to: Don Cassidy, Dean of Graduate Studies, Aurora College, Aurora, IL 60506. Application deadline 15 June 1984. An EO/AA Employer.

### PROGRAMMER/ANALYST

Growing Colorado food processing firm needs an experienced Programmer/Analyst. Applicants must have a 4 year college degree in computer systems or related field plus at least 3 years Programmer/Analyst experience beyond college. Applicant should also have VAX BASIC or BASIC PLUS 2 language skills; VAX/VMS or RSTS operating system experience; some supervisory skills; business applications experience; and good oral and written communications skills. The successful applicant will have major responsibility for the conversion of our DEC 11/70 system to a VAX system. He will be involved in programming, analysis and design. He must be a self-starter. We offer a competitive salary and benefit package. Applicant should send resume and salary history to Longmont Foods, P.O. Box 1073, Longmont, CO 80502. Equal Opportunity Employer.

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Data Processing

## OPPORTUNITIES IN COMPUTER PROGRAMMING SAUDI ARABIA

The King Faisal Specialist Hospital and Research Centre in Riyadh, Saudi Arabia, offers exceptional opportunities for experienced and qualified PROGRAMMERS/ANALYSTS to join the staff of the Management Information Systems Department. The Hospital, a 250-bed acute care specialty referral complex with an additional 150-bed medical care facility, large outpatient clinics under current expansion and a research centre, is the Kingdom's premier facility providing high-quality health care in Saudi Arabia.

As an ANALYST I or II, you will be involved with designing/testing program logic and coding/preparing programs for computer operations. Operating systems and applications for the Hospital's IBM 4331 and 4341 consist of DOS/VSE; ICCF; CICS/VS; VSAM; DOS/VS-COBOL; DOS/VS/DL/1; PCS/ADS; IBM's HCS registration, admissions and appointment packages; SI general ledger package; and inhouse systems of ap/ar; materials management; inventory; payroll and personnel; etc. Qualified candidates must have a BS in Computer Sciences/Programming or a related field, CICS and COBOL experience, DL/1 data base knowledge, and at least five years practical experience in EDP programming. Experience on PCS/ADS and with IBM's HCS Packages is highly desired/preferred. Annual compensation for these positions start at approximately \$34,000 upon qualification.

As a SYSTEMS PROGRAMMER I,\*you will assist with the generation, programming/maintenance, data base structure design and data communication for VM operating systems on the IBM 4341. Qualified candidates must have training in these areas with a BS in Computer Science/Programming, CICS/VSE systems and current hardware systems architecture experience, and at least four years minimum experience in EDP, two years of which are required to have been in systems programming. Annual compensation for this position starts at approximately \$39,000 upon qualification.

In addition to the potentially U.S. tax-free salaries, the benefits are exceptional and include free furnished housing, free transportation, 30-days annual paid vacation, education tuition for eligible dependents, bonus pay and leave, and more. The selected candidate will be employed by, have a contract with, and work directly for the Government of the Kingdom of Saudi Arabia.

To be considered for these positions with the Hospital's multinational data processing team, please submit your resume with complete salary history for immediate processing to: HCA International Company, Dept. CW-0714, P.O. Box 550, Nashville, TN 37202. (HCA International Company is an Equal Opportunity Employer.)

## HCA International Company



## ATTRACTIVE OFFERS AT IPA, SAUDI ARABIA

Institute of Public Administration (IPA) has immediate openings for very experienced and qualified Computer Specialists, as:

- \* Senior System Programmers (MVS/JES 2, VM/ CMS)
- \* TELEPROCESSING SPECIALISTS
- NCP, NCP/EP, VTAM

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#### IPA OFFERS:

- \* Attractive salaries (in the range of US\$36,000 - 70,000 Per year depends on qualification and experience).
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### • VSAM

Design and implement VSAM Transparency capability for M204 DBMS, write IBM assembler language routines to interface with Cobol, CICS and M204 DBMS. Requires strong IBM assembler language programming experience building systems software, 4-7 years experience using VSAM and CICS, and application development and DBMS experience.

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Design and implement extensions to Data Dictionary system, including new user interfaces, definitions of logical views of data, and integration of Dictionary with CCA's M204 Product. Requires 2-5 years' programming experience (including development of medium to large systems), with knowledge of data modeling concepts, IBM mainframe and database desirable. BS in CS or equivalent.

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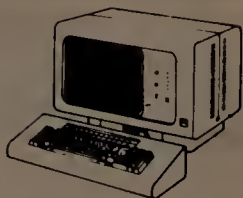
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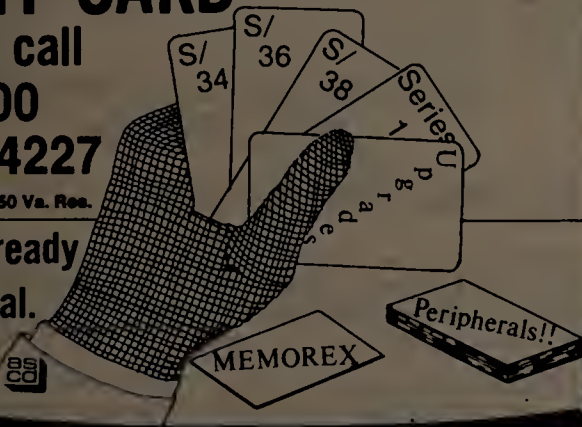
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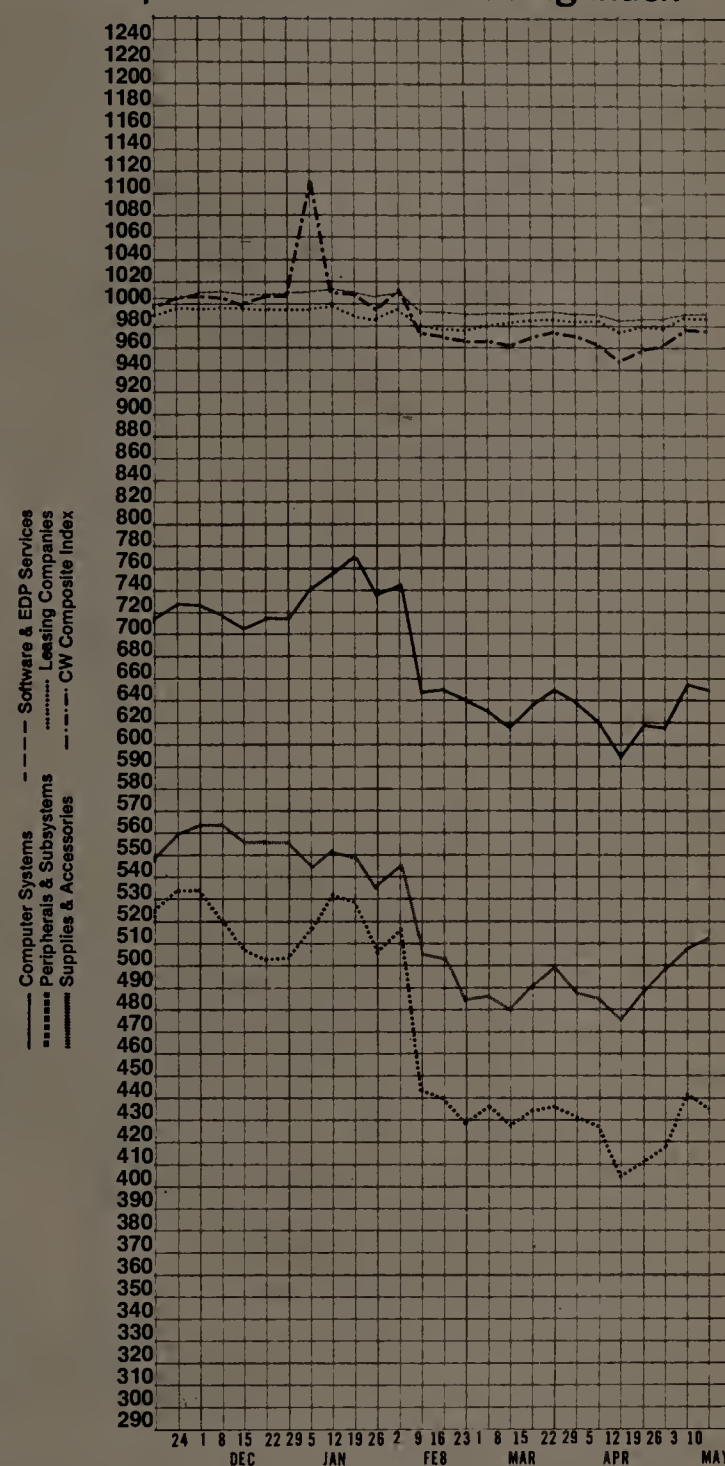
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All statistics compiled,  
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E X C H		PRICE			
		1983-84 RANGE (1)	CLOSE MAY 8 1984	WEEK NET CHNGE	WEEK PCT CHNGE
		COMPUTER SYSTEMS			
D	ALPHA MICROSYSTEMS	11-24	13 1/2	-2 1/2	-15.6
A	ALTO COMPUTER SYST	8-28	11 1/2	+ 1/4	+2.2
A	AMDHL CORP	8-30	13 3/4	+ 3/8	+2.8
D	APPLE COMPUTER INC	18-63	33 1/8	+ 1/8	+0.3
N	AT&T	13-70	16 1/2	0	0.0
N	BURROUGHS CORP	28-58	52 7/8	+ 5/8	+1.1
D	COMPUTER AUTOMATION	6-17	6 1/4	+ 1/2	+8.6
A	COMPUTER CONSOLES	8-25	13	+ 3/4	+4.1
N	CONTROL DATA CORP	21-62	32	+ 1/8	+0.3
D	CONVERGENT TECHNOL	13-41	17 5/8	+ 5/8	+3.6
N	GRAY RESEARCH INC	20-58	46 1/8	- 1/4	-0.5
N	DATA GENERAL CORP	10-48	47 5/8	-1 5/8	-3.2
N	DATAPoint CORP	11-36	24 3/4	+ 7/8	+8.1
N	DIGITAL EQUIPMENT	62-132	92 3/8	-3 1/8	-3.2
A	EEDO INC	6-16	14 3/8	- 3/8	-2.5
N	ELECTRONIC ASSOC.	3-15	6 1/4	+1 1/8	+21.9
N	FLOATING POINT SYST	13-44	16 7/8	-1	-5.5
N	FOXBORO	22-47	33 5/8	+ 1/8	+0.3
D	GENERAL AUTOMATION	3-16	13 1/8	+ 1/4	+1.9
N	GOULD INC	26-44	28 1/4	-1 5/8	-5.4
N	HARRIS CORP	20-51	31 5/8	- 1/2	-1.5
N	HEWLETT-PACKARD CO	22-48	34 3/8	- 7/8	-2.4
N	HONEYWELL INC	28-68	53 3/4	+ 7/8	+8.2
N	IBM	57-134	112 7/8	-3 3/8	-2.9
D	IPL SYSTEMS INC	4-14	4 3/4	+ 1/2	+11.7
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D	TANDEN COMPUTERS INC	14-40	23	+1 3/8	+6.3
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D	TELXON CORP	8-16	11	+ 3/4	+7.3
N	TEXAS INSTRUMENTS	71-176	144	-3 5/8	-2.4
A	ULTIMATE CORP	8-24	17 7/8	-1 3/8	-7.1
D	VECTOR GRAPHICS INC	1-14	1 1/2	0	0.0
A	WANG LABS "A"	13-42	28 1/4	0	0.0
A	WANG LABS "C"	11-42	28 1/8	+ 1/8	+0.4
N	XEROX CORP	35-52	40 1/4	- 3/4	-1.8

## LEASING COMPANIES

D	BOOTH FINANCIAL CP	11-42	38	- 1/2	-1.2
N	COMBICO INC	7-42	13 3/8	-1 3/8	-9.3
D	CONTINENTAL INFO SYB	3-18	8 3/8	+ 3/8	+4.6
N	OFF INC	5-15	13 3/4	+ 3/8	+2.8
D	PHOENIX AMERICAN INC	8-17	8	0	0.0
D	SELECTER INC	11-21	14	+ 1/2	+3.7
N	U.S. LEASING	18-47	32 1/2	0	0.0

## COMPONENTS

N	ADVANCED MICRO DEV	13-37	33 1/4	-1 3/8	-3.8
D	ADV'D SEMICONDUCTOR	12-38	25 3/4	- 1/2	-1.9
N	ANALOG DEVICES INC	14-32	22 1/4	- 1/4	-1.1
D	ANALOGIC CORP	14-27	16 1/4	+1 1/4	+8.3
N	APPLIED MAGNETICS CP	15-37	20 1/8	- 3/8	-1.8
N	TERADYNE	14-39	28 3/4	-2 1/2	-8.0

E X C H		PRICE			
		1983-84 RANGE (1)	CLOSE MAY 8 1984	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
D	ADVANCED COMP TECH	1-8	3 1/4	0	0.0
D	ADVANCED SYSTEMS INC	6-22	15 3/4	+ 1/8	+0.7
D	AGS COMPUTERS INC	7-32	19 1/4	+1	+5.4
D	AMERICAN SOFTWARE	13-31	14 7/8	+ 5/8	+4.3
N	ANACOMP INC	2-23	3 5/8	+ 7/8	+31.8
D	ANALYSTS INTL CORP	5-20	6	- 3/4	-11.1
A	APPLIED DATA RES.	8-37	20 1/2	- 7/8	-4.0
D	ASK COMPUTER SYSTEMS	6-21	16	0	0.0
B	ASTRADYNE COMP INC	1-7	1 3/4	0	0.0
N	AUTOMATIC DATA PROC	21-33	13 1/4	-1	-2.8
D	CGA COMPUTER ASSOC	5-17	10 3/8	- 5/8	-5.6
D	COMPUTER ASSOC INT'L	5-35	21	0	0.0
D	COMPUTER HORIZONS	8-20	11 3/4	- 1/4	-2.0
D	COMPUTER NETWORK	4-10	5 7/8	- 1/8	-2.0
N	COMPUTER SCIENCES	11-23	14 5/8	-1 1/8	-7.1
D	COMPUTER TASK GROUP	8-22	14	- 1/4	-1.7
D	COMPUTER USAGE	2-22	6 1/2	- 3/4	-10.3
D	COMPUTONE SYSTEMS	5-38	5	+ 1/8	-2.4
D	COMSERV CORP	2-20	3 3/4	+ 7/8	+30.4
D	COMSHARE	7-14	8	+ 1/4	+3.2
N	CULLINET SOFTWARE	12-50	33	- 1/8	-0.3
D	CYCARE SYSTEMS INC	9-27	17 1/2	+ 1/4	+1.4
N	ELECTRONIC DATA SYST	10-42	30 1/4	- 3/8	-1.2
D	HOGAN SYSTEM INC	14-27	18	+1 1/2	+8.5
N	GENERAL ELECTRIC CO	45-58	54 7/8	-1 1/2	-2.8
N	GTE CORP	36-48	38 1/8	- 3/4	-1.9
N	INFORMATICS INC	10-34	22 3/8	+1 1/8	+5.2
D	INFOTRON SYSTEMS COR	25-43	32 1/4	+1	+3.1
D	KEANE ASSOCIATES	4-15	8	+1 1/2	+20.0
A	LODICOM	8-31	23 1/8	+ 7/8	+3.9
D	MCI COMMUNICATIONS	8-34	9	- 1/4	-2.7
D	MMOT SCI AMER INC	8-33	19 5/8	- 3/8	-1.8
D	MATHEMATICAL APP GRP	8-22	7 1/2	0	0.0
D	MICOM SYSTEMS INC	25-50	39 3/4	+ 1/2	+1.2
D	MONCHIK-WEBER CP	5-22	8 1/4	- 1/2	-5.7
D	NATIONAL DATA CORP	5-28	17 3/4	- 5/8	-3.4
D	ON-LINE SOFTWARE INT	8-27	11 1/2	- 1/2	-4.1
D	PANSONIC SYSTEMS	8-30	15 1/8	+1 7/8	+14.1
N	PLANNING RESEARCH	6-21	13 7/8	0	0.0
D	POLICY MGMT SYBTS CP	15-35	29	+ 1/4	+0.8
D	PROGRAMMING & SYS	1-8	4 1/2	+ 1/8	+2.8
D	REYNOLDS & REYNOLD	17-53	33 3/4	+ 3/4	+2.2
D	SEI CORP	11-34	14 3/4	+ 1/2	+3.5
D	SHARED MEDICAL SYST	13-43	28 1/4	-1 1/2	-4.8
D	SCIENTIFIC COMPUTERS	8-14	9 1/2	- 1/2	-5.0
D	SOFTWARE AG	5-17	12 1/2	+ 3/8	+3.0
N	TYNSHARE INC	12-30	25	0	0.0
A	URS CORP	5-18	11 3/8	- 1/8	-1.0
N	WYLY CORP	7-17	10 1/8	- 1/8	-1.2

## PERIPHERALS &amp; SUBSYSTEMS

P	AM INTERNATIONAL	2-7	3	+ 1/8	+4.3
A	ANDERSON JACOBSON	7-26	9 1/2	- 1/4	-2.5
D	AUTO-TROL TECHNOLOGY	8-28	17 1/4	0	0.0
D	BANCTEC INC	7-33	8 1/4	0	0.0
A	BEEHIVE INT'L	3-15	3 1/4	-1 3/8	-29.7
N	BOLT, BERANEK & NEW	5-30	21 7/8	+1	+4.7
D	CAMBEX CORP	1-4	1 5/8	0	0.0
N	CENTRONICS DATA COMP	6-28	11 3/8	- 1/2	-4.2
A	CETEC CORP	4-12	8 1/4	0	0.0
D	COMINITRONICS	2-20	8 1/4	+ 3/4	+10.0

E X C H		PRICE			
		1983-84 RANGE (1)	CLOSE MAY 8 1984	WEEK NET CHNGE	WEEK PCT CHNGE
D	COMPUTER DEVICES INC	0-21	5/8	-	-8.2
D	COMPUTER TRANSCIVER	3-12	2 7/8	- 1/8	-4.1
N	COMPUTERVISION CORP	18-53	36 1/8	-1 1/8	-3.0
N	CONRAC CORP	14-38	14 3/4	- 1/2	-3.2
A	DATAPRODUCTS CORP	18-41	23 3/4	+ 1/8	+0.5
A	DATARAM CORP	5-12	8 1/8	+ 3/8	+4.2
D	DATA SWITCH CORP	13-41	20 1/2	- 3/4	-3.5
D	DATUM INC	2-17	6 3/8	+ 1/8	+2.2
D	DECISION DATA COMPUT	3-16	10 1/2	+ 7/8	+9.0
D	DECUTEL-OLIVETTI	7-38	8 1/4	-1 1/8	-12.0
N	ELECTRONIC M & M	5-11	7	- 1/4	-3.4
D	ENDATA, INC	9-16	10	+ 1/4	+2.5
D	EVANS & SUTHERLAND	17-50	20 1/4	+ 1/4	+1.2
D	DANALF TECHNOLOGIES	9-22	10 3/4	+ 3/4	+7.5
D	GEN L DATA COMM IND	5-33	31 1/4	+1 1/4	+4.1
D	GREAT SOUTHWEST IND	1-6	1	0	0.0
N	HAZELTINE CORP	7-31	28	+1 7/8	+7.1
D	ICOT CORP	3-10	3 5/8	- 3/8	-9.3
D	INFORMATION INTL INC	10-22	11 3/4	+ 1/8	+1.0
D	INFORMATION SCIENCE	8-17	8	- 1/2	-5.8
D	INTEL CORP	11-45	34 1/4	-3 1/2	-9.2
D	IPL SYSTEMS INC	4-14	4 3/4	+ 1/2	+11.7
A	LUNGY ELECTRONICS	7-18	10 5/8	- 1/4	-2.2
U	RESEARCH	1-10	8 1/2	+ 3/4	+8.5
A	MSI DATA CORP	16-37	15 1/4	-2	-10.8
N	NASHUA CORP	8-28	25 7/8	- 5/8	-2.2
D	NETWORK SYSTEMS CORP	8-34	21 7/8	+ 1/8	+0.5
N	NO AMERICAN PHILIPS	17-40	35	0	0.0
D	NORTHERN TELECOM LTD	22-49	33 1/4	-1 3/4	-5.0
D	ONEX	1-6	1/4	0	0.0
N	PARADYNE CORP	13-30	16 7/8	-1 1/8	-8.2
A	PERNILL CORP	7-14	11 3/4	+ 3/8	+3.2
D	PI EN AMERICAN INC	7-17	8	0	0.0
N	PLESSEY CO (ADR)	26-41	31	-1 1/2	-4.6
D	PRINTRONIX INC	20-34	23 1/4	0	0.0
D	RAMTEK CORP	9-26	10 3/4	+1 1/2	+16.2
D	RAYTHEON CO	36-58	38 1/2	-1 7/8	-4.7
N	RECOGNITION EQUIP	4-17	8 1/8	- 3/8	-2.6
N	ROLM CORP	30-80	34 1/2	- 1/2	-1.4
N	SANBERS ASSOCIATES	36-120	42	-2 3/8	-5.3
D	SCAN DATA	1-3	3/8	0	0.0
D	SCAN-TRON CORP	12-19	13	+ 1/2	+4.0
N	SCIENTIFIC ATLANTA	9-23	10 5/8	- 3/8	-6.5
N	STORAGE TECHNOLOGY	9-10	3/4	-1 1/2	-11.1
D	SYNEX DATA/PRODUCTS	9-27	3 1/2	- 1/8	-3.3
D	SYSTEMS & COMP TECH	20-38	25 1/2	- 3/4	-2.8
A	T BAR INC	7-17	10 1/8	- 3/8	-3.5
A	TAB PRODUCTS CO	5-20	18 1/2	+1 3/8	+8.0
D	TANDON CORP	10-35	10 1/8	-1 3/4	-14.7
A	TEC INC	8-12	11 1/8	- 5/8	-5.3
N	TEKTRONIX INC	34-87	61	-4	-6.1
D	TELEX	5-32	23 5/8	+ 1/2	+2.1
D	TESOATA SYSTEMS CP	3-17	5 1/4	- 1/4	-4.5
N	TIMEPLEX INC	7-29	16 5/8	- 3/8	-2.2
D	VISUAL TECHNOLOGY	9-26	12 3/4	+ 1/4	+2.2





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